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# Dental Digest

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**April 1950**

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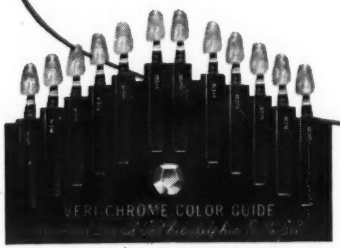


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Vol. 56 No. 4

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## *About Our* CONTRIBUTORS

BERNARD A. MARTIN, D.D.S. (Indiana University, School of Dentistry, 1924) has been assistant professor of prosthetics at the Indiana University School of Dentistry for the last four years. Doctor Martin is engaged in general practice and for his initial appearance in DIGEST, presents IMMEDIATE DENTURE IMPRESSION, which describes a step-by-step procedure for taking such an impression.

ELLSWORTH K. KELLY, D.D.S. (University of California, College of Dentistry, 1934) has been engaged for the past two years in prosthodontic reconstruction for maxillofacial patients at Valley Forge General Hospital which is the plastic and maxillofacial center of the United States Army. Doctor Kelly presents in the current issue, FULL AND PARTIAL DENTURES AFTER EXTENSIVE BONE GRAFTS TO THE MANDIBLE, in which he discusses the problems and the surgical measures applied in making satisfactory dentures where bone grafts to the mandible have been necessary.

The seventh article in the series of case histories currently presented by JOSEPH E. SCHAEFER, M.D., D.D.S., and RALPH C. RUDDER, M.D., D.D.S., REDUCTION OF MANDIBULAR FRACTURE WITH DIRECT WIRING, deals with a case of mandibular fracture successfully treated by means of the open reduction technique where intermaxillary wiring or external pin fixation was impossible.

MONTAGUE A. CASHMAN, B.S., D.D.S. (Georgetown University, School of Dentistry) who publishes in DENTAL DIGEST for the first time this month, presents PREOPERATIVE SUTURING IN ORAL SURGERY, which gives a detailed description of a method of suturing which the author has found to be successful in difficult cases.

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# IMMEDIATE DENTURE *Impression*

BERNARD A. MARTIN, D.D.S., Indianapolis


## DIGEST

***This article describes in detail a procedure for an immediate denture impression which results in a completely muscle-trimmed and postdammed denture that can be refitted when necessary and that will give the patient service for many years.***


### *Preparation of Mouth*

1. The posterior teeth should be removed.

2. Sufficient time must be allowed for satisfactory healing.

### *Primary Impression*

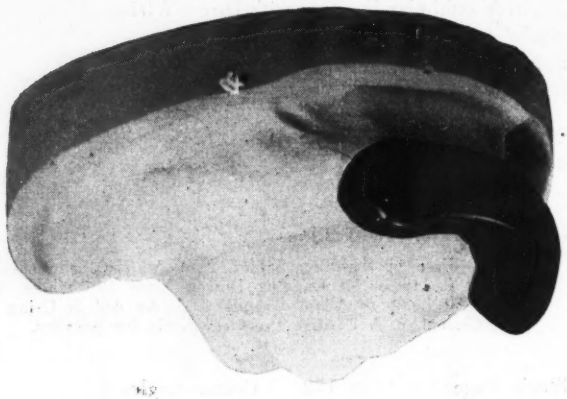
1. A piece of pink baseplate wax is cut a little wider than the length of the anterior teeth. Two strips of the wax are warmed together, giving a double thickness. The wax is then wrapped around the anterior teeth, (1) molded and seared together, (2) removed and replaced, and (3) trimmed just to the gingival line (Fig. 1).

2. The wax cap is now laid to one side and a large, deep tray is fitted to the mouth. Two or three sheets of compound are warmed and placed in the tray. The compound is partly molded with the fingers and the surface rewarmed. (1) Slip the cap of wax over the anterior teeth and (2) immediately take a compound impression of the entire upper mouth, removing the wax in the compound impression (Fig. 2).

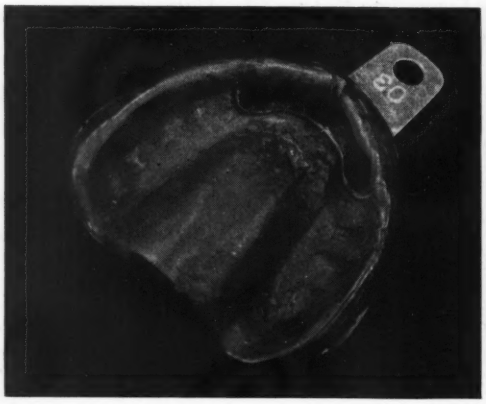
3. The wax is peeled out of the impression, leaving a well in the anterior area, and a model is poured (Figs. 3 and 4).

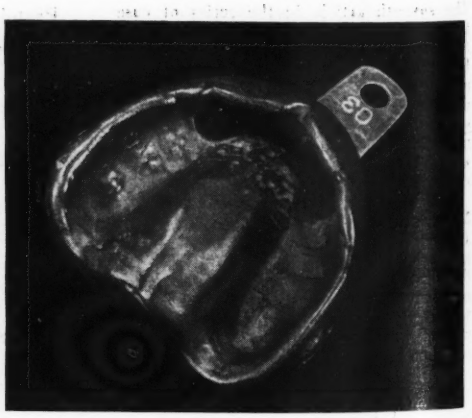
*Waxing*—1. Outline on the model, according to the landmarks, where the border of the tray should be built. Wax up a tray to this outline (Fig. 5).

2. In waxing the tray use two thicknesses of pink baseplate wax, being careful not to stretch it, thus



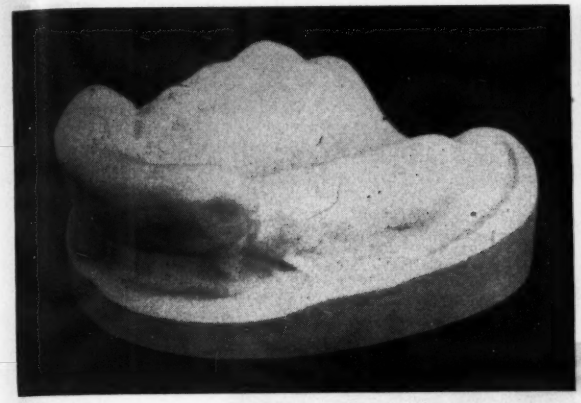
**1.** *Wrap remaining anterior teeth with double layer of sheet wax.*





**2.** *Take full mouth compound impression, removing wax in impression.*

**3.** *Remove wax from the impression.*



**4.** *Pour model.*

**5.** *Wax up tray, flask, and cure in acrylic or vulcanite.*

**6.** *Apply a thin layer of low fusing compound to the palatal area only.*

**7.** *Immerse in simmering hot water.*

causing the tray to be thin in some areas. Rather, fold the wax over the model and splice it so that it has uniform thickness.

3. The waxed tray is (1) flasked, (2) boiled out, (3) packed with acrylic, and (4) cured. The curing time should be the same as for a denture as this will result in a material that

**8.** *Seat in mouth with light pressure.*

**9.** *Add compound to half of impression on side of tray.*

**10.** *Immerse this side only in simmering hot water.*

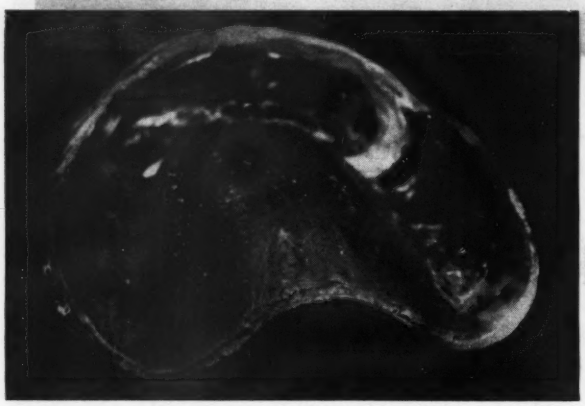
will retain its shape and will not warp.

*Fitting the Tray*—1. The finished tray is now placed in the mouth, fitted, and relieved for all muscular movements. The posterior border is trimmed accurately so that it applies to the immovable compressible area just anterior to the movable part of the soft palate.

2. The position of the tray is determined by marking on the palate with indelible pencil and transferring the outline to the tray.

3. When the tray is trimmed, (1) replace it in the mouth, (2) check the posterior border by having the patient say "ah," and (3) recheck for freedom of the border tissue attachments.

**11.** ***Place in the mouth with the same light pressure.***



**12.** ***Palate and one inner side completed.***

**13.** ***Inner part of impression completed except the well.***

**14.** ***Compound added to half of the border.***

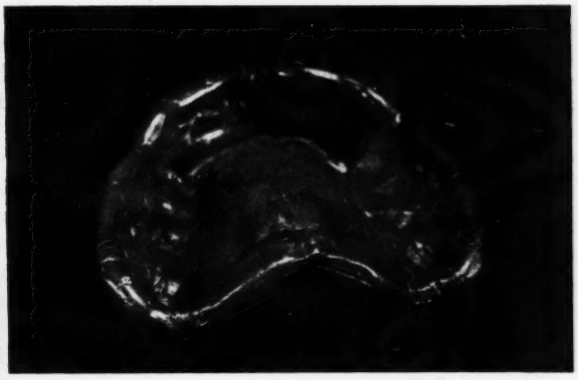
**15.** ***Half of border muscle trimmed.***

**16.** ***Impression completed except the well, and post-dam.***

## *Armamentarium*

1. To apply the compound, a double boiler consisting of a cup at-

**17.** *Adding postdam wax.*



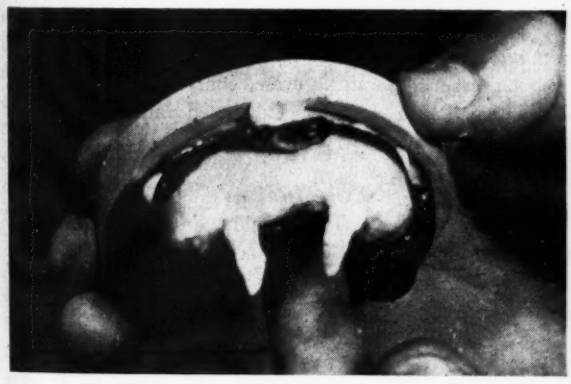
**18.** *Impression postdammed.*

tached to the inner side of a pan is used. The cup holds the compound and the pan is filled with water which is kept just below the boiling stage or at the point of simmering.

2. At a temperature of approximately 185° Fahrenheit the compound in the cup is of a consistency to flow so it will spread easily over the desired area.

3. Low fusing compound, green stick by Kerr, or Exact by S. S. White, is used.

**19.** *Holes cut in the well.*



**20.** *Final seating of impression with alginate in the well.*

**21.** *Removing surplus alginate.*

4. Compound sticks can be used but the low fusing compound described can be spread a little more evenly from the cup with a spatula (Fig. 6).

### Procedure

1. A thin layer of compound is spread over the palatal area of the tray. This is dipped in the hot water, placed in the patient's mouth, and seated with gentle pressure with one

**22.** *Complete muscle-trimmed and postdammed impression.*

finger in the center of the palate. The pressure should be about equal to that exerted on an upper denture when a patient closes and swallows (Fig. 8).

2. This part of the impression should be warmed and returned to the mouth at least three times to keep the thickness of the compound as thin as possible.

3. If any surplus material flows out over the crest of the ridges, it should be removed and this part of the impression allowed to extend only to the crest of the ridges. The posterior border is trimmed flush with the tray.

4. When this part of the impression is satisfactory, more compound may be added along one side or half of the border (Fig. 9). Only that part of the tray where fresh compound has been added is immersed in the simmering water (Fig. 10).

5. The tray is seated in the mouth with the same gentle pressure. Corrections that must be made in any of the steps described should be made before proceeding to the next step. Surplus material that has gone beyond the border of the tray should be trimmed off even with the tray (Figs. 11 and 12).

6. When this side is completed, the opposite side is done in the same manner. The inner part of the impression, except the well, is thus completed (Fig. 13).

### Muscle Trimming

1. Along one-half of the border of the tray apply a roll of compound about the size of a kitchen match stick (Fig. 14).

2. Immerse only the border in simmering water and place the impression in the mouth. Instruct the patient to suck on the impression and, if necessary, stabilize the impression with one finger.

3. Warm the border again and instruct the patient, with the mouth open, to pull the muscles of the face to one side, laugh, and perform all of the facial movements possible. This exercise should muscle trim the border in areas except the heel.

4. Now add a little more material to the border at the heel, warm just that part, and with the impression in the mouth, direct the patient to swing the mandible from side to side and extrude the chin. This measure will muscle trim the heel in such a manner that the denture will never be dislodged by any mandibular movements. The muscle trimming on one side is now completed (Fig. 15).

5. The opposite side is muscle trimmed in precisely the same way, following the same steps. The impression is now accurate in every detail except (1) postdam, and (2) the area around the teeth or the well (Fig. 16).

### Postdam

1. For accuracy, postdamming should be done *in the mouth*. Use (1) a wax which is of about the consistency of red carving wax, or (2) a plastic wax.

2. A small roll of the wax is applied to the posterior border (Fig. 17).

3. Dip quickly into the simmering water, and seat firmly in the mouth as this is the only area in the mouth where it is desirable to displace tissue slightly. The patient should move the soft palate by saying "ah" and swallowing. Any surplus material which flows over the border should be trimmed even with the tray (Fig. 18).

### Testing

1. Now test the impression for seal and stability in every manner. If the impression can be dislodged by any muscle or movement, corrections should be made.

2. The impression of the teeth in the anterior well should now be completed.

### Impression of Teeth

1. To allow for escape of the surplus impression material (1) two large holes are drilled in the bottom of the well, or (2) smaller holes are made with a number 560 bur.

2. Mix a small amount of alginate. Fill the anterior well about half full and immediately seat the impression in the mouth (Fig. 20).

3. When the alginate has set, remove the impression and thin areas of alginate that may have worked back onto the compound or out onto the borders (Fig. 21).

### Comment

The result of the steps described is an accurate, completely muscle-trimmed, postdammed impression (Fig. 22).

### Conclusion

The technique described affords the patient a completely balanced denture which can be refitted when needed and which will give service for many years.

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# *Full and Partial Dentures after Extensive* BONE GRAFTS *to the Mandible*

**ELLSWORTH K. KELLY, D.D.S.**

**Phoenixville, Pa.**

**DIGEST**

***Most war wounds of the face involved avulsion of tissue, including parts of the mandible. In the reconstructive surgery that was done, a bone graft to the mandible was necessary.***

***Numerous bone grafts of this kind have been performed during and since the war. Stout and Blocker[1] reported 1,010 cases of bone grafts of the mandible done between 1944 and 1946 at various Army and Navy hospitals. The purpose of these grafts is to restore form and function and because most, if not all, of the teeth are lost, a partial or a full denture must be constructed, (1) to obtain function, and (2) to complete the filling-out of the contour of the lower part of the face.***

***In order to understand the problems involved in constructing dentures for patients who have suffered wounds of the face, the author of this article describes in detail the reconstructive surgery employed.***

## *Technique*

1. A pedicle graft of soft tissue is raised and brought to the face to make a bed for the bone graft. This is done in stages and requires a number of surgical operations.

2. After enough soft tissue has been grafted to the area, the bone graft is done.

3. The crest of the patient's ilium is most frequently used as the source

[1]Blocker, R. S., and Stout, R. A.: Mandibular Reconstruction. J. Plastic and Reconstructive Surg. 4:153-156 (March) 1949.

**1A.** *An x-ray of a mandible with an extensive bone graft and two molar teeth remaining unilaterally. This is a typical partial denture case encountered after bone grafting and is illustrated in Figure 7.*

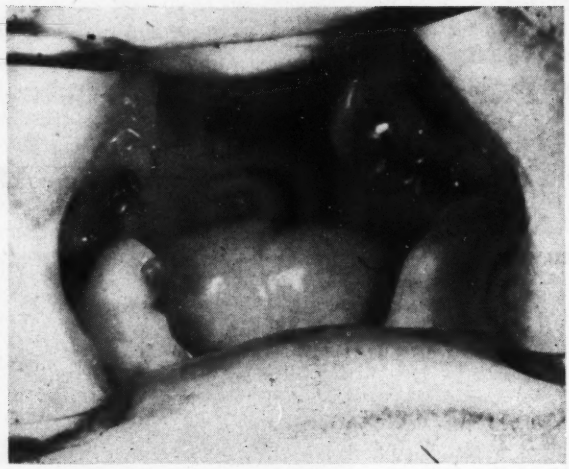
**1B.** *An x-ray of an extensive bone loss reconstructed with a tantalum tray in which pieces of cancellous bone were placed. The full denture for this case is illustrated in Figure 5.*

of the graft. The bone is usually wired to the remaining parts of the mandible with stainless steel or tantalum wires (Fig. 1A).

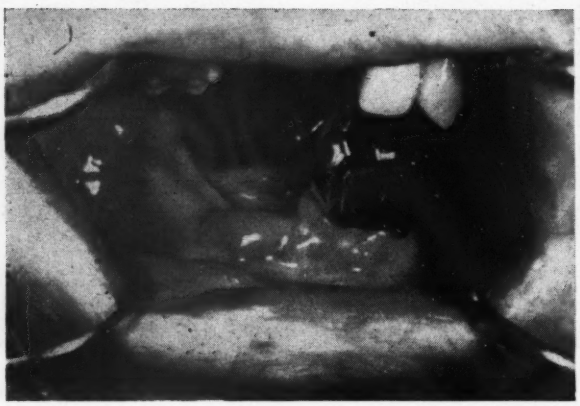
4. In extensive cases a tantalum tray is sometimes used to support pieces of cancellous bone and maintain these pieces in the desired shape (Fig. 1B).

*The Use of Cancellous Bone*—It is an interesting point that only cancellous bone is used for the extensive grafts as it has been found that a successful graft is more readily effected with cancellous bone. However, x-rays taken some months afterwards show a well-defined cortex which has developed on this cancellous bone under function.

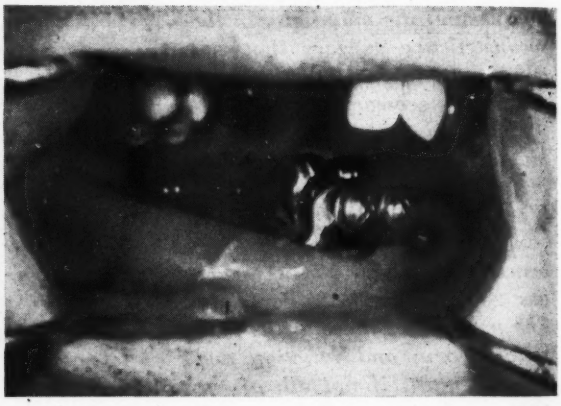
*A Lengthy Process*—The series of operations employing (1) the pedicle graft to restore the soft parts, and (2) a bone graft to complete the reconstruction takes years for completion. Patients remain in the hospital two or three years before the prosthodontist makes the final dentures on the reconstructed tissues to complete the rehabilitation.



**2.** ***A case with heavy bilateral scar bands causing not only a constricted orifice but also one with hard inelastic tissue at both commissures making impression taking extremely difficult.***



**3A.** ***A typical case after an adequate sulcus graft had been placed.***



**3B.** ***The polyethylene stent in place which was used for eight weeks to keep the split-skin graft stretched until a partial denture could be constructed.***

## *Factors Involved*

1. For successful prosthodontics the prosthodontist must have the full cooperation of the plastic and maxillofacial surgeons.

2. The surgeon must be aware of the requirements for successful prosthetic service.

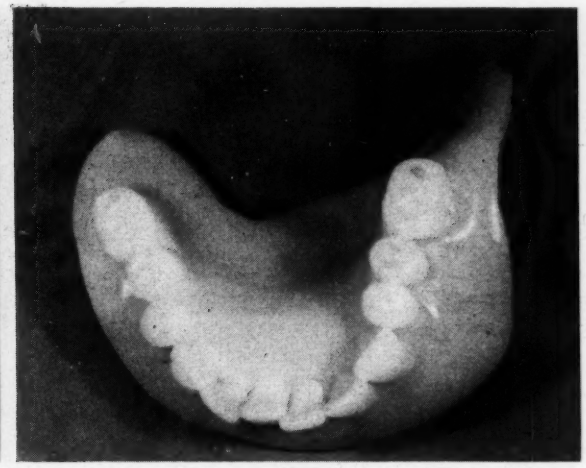
3. The surgeon must appreciate the importance of the prosthetic restoration in the patient's rehabilitation.

4. The patient's mouth must be one that can be manipulated; a major handicap is that imposed by a constricted oral orifice bound by heavy scar tissue with no elasticity (Fig. 2).

5. The prosthesis will be more successful when the bone graft is placed as close to the oral mucosa as possible and not buried under a layer of areolar tissue.

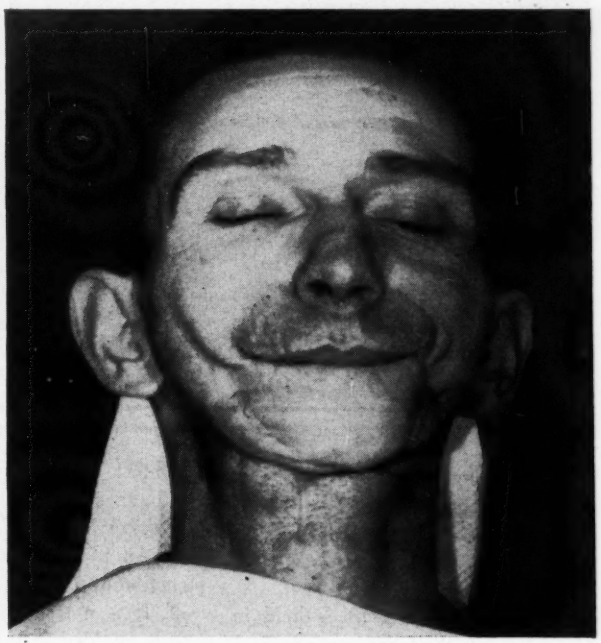
6. After the major surgery is com-

**4A.** ***Face mask of a case showing extensive avulsion of tissue and loss of the entire body of the mandible with perforations of the palate. The mandible was reconstructed with pedicle and bone grafts and full dentures were finally constructed.***



**4B.** *The full upper denture for this case showing how stainless steel hypodermic needles are processed into the denture at the palatal perforations. In finishing, the needle hubs are cut off and the needles finished flush with the palate. The purpose of incorporating these needles into the denture is to allow an exchange of air through the palate perforations so that air from the nasal passages is not forced under the denture to dislodge it. They are small enough (19 gauge) so that they do not inconvenience the patient in eating, smoking, or talking; yet they insure good retention in the denture.*

**4C.** *The lower full denture is extremely broad anteroposteriorly. This is typical of full lowers constructed over such extensive bone grafts.*



**4D.** *The dentures in place in the mouth.*

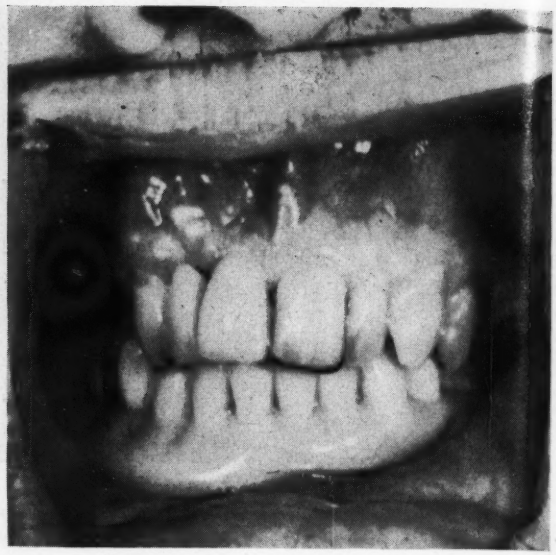
**4E.** *Full face view of the patient. Compare the final results with the face mask of this patient. He had a functioning mandible composed of grafted bone from ramus to ramus and was able to eat with his full dentures.*

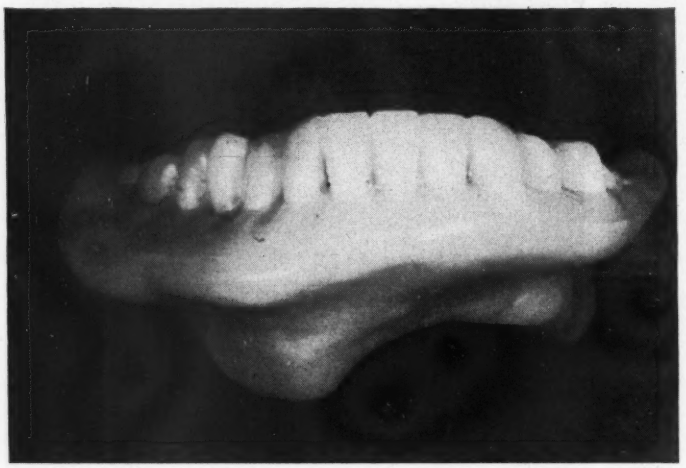
---

pleted further surgical procedure is usually necessary to prepare the mouth for dentures.

*Prosthetic and Surgical Combination*—After the initial surgery, the prosthodontist should consult the maxillofacial surgeon and work out with him the succeeding minor surgical procedures necessary before dentures can be constructed. A bone graft always leaves a mouth with no alveolar ridge as it is normally seen. To remedy this a buccal sulcus must be created and lined with a skin graft.

*Method*—1. The so-called sulcus





**5A.** *Above left: The edentulous lower shown in x-ray in Figure 1B. The whole lower is a bone graft laid in a tantalum tray. What appears to be the ridge in the mouth is folds of areolar tissue over the bone graft.*

**5B.** *Left: The lower denture for this case. Note the irregular nature of the denture base. This is caused by the pieces of cancellous bone which are placed in the tantalum tray to form the graft.*

**5C.** *Above: The denture in place. Exceptionally good retention was obtained in this case. The tantalum tray prevents the posterior fragments from lifting and good posterior extension of the lower can be achieved.*

graft[2] is accomplished by dissection of a trough somewhat larger than the sulcus desired.

2. This is lined with a split-skin graft.

3. The split-skin graft is held in place by a roll of impression compound sutured into the pocket at the time of the operation.

4. When the sutures are removed a stent must be prepared to keep the skin graft stretched until the dentures are constructed.

5. If teeth remain, this stent can be attached to them.

6. If the patient is edentulous, a bite-block with compound attached can be successfully utilized as a splint.

*Polyethylene an Excellent Material*—1. An ideal material for the construction of the splint is polyethylene.

2. It is a true thermoplastic and can be molded in a few minutes; no curing is necessary.

3. It is entirely compatible with tissue and has a rubbery consistency which gives it more elasticity than methyl methacrylate. Figure 3 shows a polyethylene stent in place and the sulcus formed by such a graft.

### *Full Dentures Over Bone Grafts*

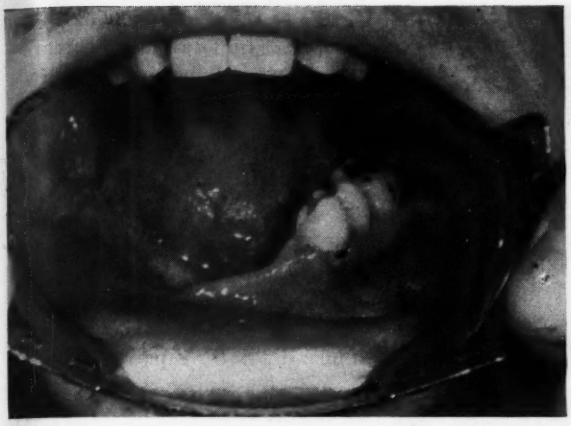
Surprisingly good results can be obtained in full dentures over bone grafts but the following difficulties must be overcome: 1. The greatest difficulty is probably the patient's loss of sensation in the grafted area which causes loss of control of food in eating.

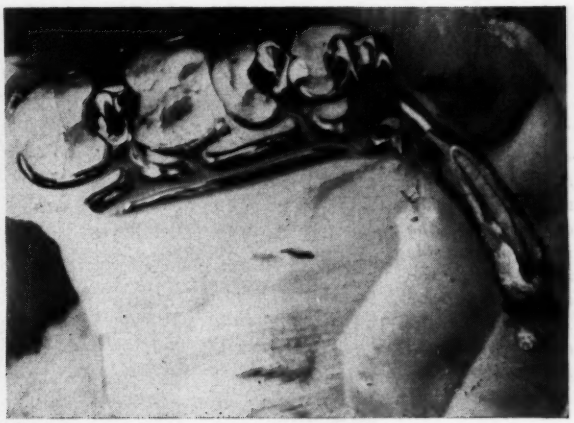
2. The difficulty in obtaining impressions through constricted mouths.

3. The presence of more loose connective tissue overlying the bone graft than is desirable for full denture support.

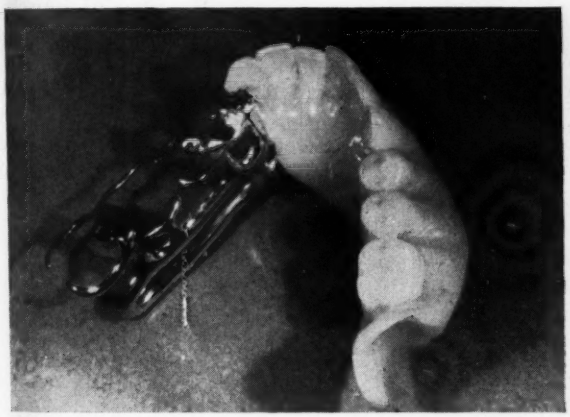
*Procedure*—The problem of loose connective tissue can be partly overcome by using a technique giving considerable displacement of tissue: 1. A full compound impression taken

[2]Weiss, L. R.: The Intra-oral Skin Graft as an Aid to Denture Construction, J.A.D.A. **34**:389-395 (March 15) 1947.





**6A.** *A partial case with a graft from the midline to the angle.*
**6B.** *The framework, showing a stress-breaker used to allow movement which is beyond that encountered in the normal case because of the lack of soft tissue support in the grafted half of the mandible.*



**6C.** *The completed denture. After the occlusion has been ground in, the anterior connector in the double-bar is cut with a disc, allowing the stress-breaker to function.*
**6D.** *The case in the mouth.*

in an aluminum tray which is especially cast for each case gives the best results.

2. The full compound impression is corrected with impression wax or paraffin.

3. Under the pressure of a denture, the tissues over the bone graft change rapidly and some of the loose connective tissue is resorbed. For this reason it is necessary to remake or rebase the denture after the first month or two. A much more stable denture is then achieved because of the somewhat rapid change in the character of the tissues.

*Full Denture Cases*—Figures 4 and 5 show typical full denture cases over extensive bone grafts.

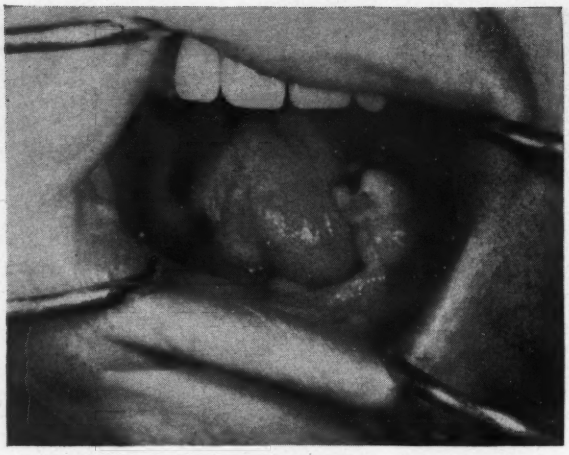
2. Figure 4 illustrates (1) an extremely severe case with a mask of the patient before reconstructive work, (2) a picture of the full dentures constructed for this patient, and (3) a picture of the patient with the dentures in the mouth. This patient wore the dentures successfully and ate with them despite the lack of sensation in the lower part of the face and mouth.

3. Figure 5 is the case of a patient whose x-ray appears in Figure 1. The tantalum tray remains in the tissue and causes no trouble.

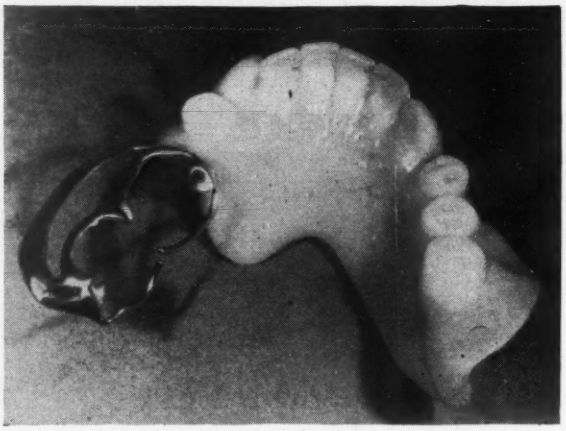
*Nonanatomic Teeth Indicated*—Even with a good sulcus graft, the support for a full denture in reconstructive bone graft cases is invariably flat. Little resistance to lateral displacement exists. For this reason, nonanatomic or cuspless teeth are indicated and are used routinely.

### *Technique Involving Remaining Teeth*

Often a few teeth are left. These are carefully restored and retained to give retention and support to a partial denture. This obviates some of the problems encountered in full dentures. However, the remaining teeth are usually tipped or rotated which sometimes presents a problem. Also, the teeth are generally situated awk-



**7A.** ***Unilateral case with an extensive graft extending from just anterior to the molar on one side to the angle on the other side. The x-ray of this case is shown in Figure 1A.***



**7B.** ***The partial denture for this case was made with wire arms in the lingual undercuts because of extensive tipping of the two remaining teeth to the lingual. The wire arms are incorporated into the casting and are flexible enough to provide simple stress-breaking.***

**7C.** ***The denture in place.***

wardly in the arch for partial denture construction.

*Typical Positions*—1. Two molars remaining on one side or two molars on one side and one on the other with no other teeth is a common situation.

2. In a normal case these teeth would be extracted in favor of a full denture. However, in cases for rehabilitation the support of a few teeth is helpful and they are, therefore, retained although the planning of a partial denture is difficult.

*The Use of Stress-Breakers*—In restorative cases of this kind stress-breakers may be used to advantage:

1. A stress-breaker involving (1) a reversing arm to avoid a fulcrum on the anterior of the remaining teeth, and (2) a sliding pin in tube has been extremely useful (Fig. 6).

2. Excellent results have been obtained by using a flexible wire clasp arm incorporated in a casting. A flexible wire arm provides the retention and the cast portion is kept out of the undercut and provides bracing against lateral stress. This design is similar to Hardy's partial denture.[3] Figure 7 illustrates a case constructed in this manner.

*Advantages*—1. The design can be kept simple.

2. The wire arm gives ample retention and at the same time allows independent movement of the clasped teeth and prevents excessive stress.

3. In some cases the bar clasp of Doctor Roach can be used to advantage.

4. In cases where an ample number of healthy teeth are left unilaterally while poor tissue support exists on the edentulous side because of the bone graft, a rather rigid retention is desired and a series of bar clasps with the strut-bar of Roach is employed (Fig. 8). This technique is usually successful.

## Partial Dentures

As in full dentures for the maxillofacial case, in partial dentures it is desirable that cuspal interference be eliminated. Often, therefore, nonanatomic teeth can be used for the partial case. If cuspless teeth are not used, care must be taken to adjust the occlusion carefully in the finished case to avoid cuspal interference.

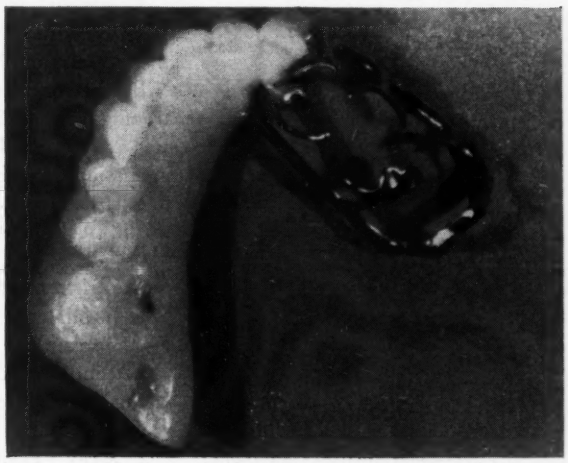
## Conclusion

Although difficulties exist in constructing dentures for cases, following extensive plastic surgery, if the principles of (1) modern partial denture design, and (2) full denture construction are used, the results are surprisingly successful.

2. Because the Veterans Administration employs dentists who are engaged in personal practice for most

[3] Hardy, I. R.: Partial Lower Denture Design, DENTAL DIGEST **44**:56-60 (February) 1938.

**8A.** *A grafted case with a number of good teeth unilaterally and firm soft tissue support despite great loss of substance at the midline.*



**8B.** *The partial denture showing the use of labial and lingual bars and extensive use of T-clasps. This is the strut-bar of Roach. This design gives excellent stability and retention but must only be used where (1) the edentulous area is firm enough or (2) multiple teeth can be clasped so that excessive stress is not brought to bear on the clasped teeth. The teeth are clasped firmly and little stress-breaking action is achieved.*

**8C.** *The finished strut-bar partial denture in the mouth.*

of their dental treatment, more and more rehabilitation cases will find their way to the private practitioner.

3. These cases are a challenge to the prosthodontist and some help may be obtained from the experiences gained in treating large numbers of reconstructive cases at Army Plastic and Maxillofacial Centers.[4]

*Valley Forge General Hospital.*

[4]Emory, L.: Partial Denture Prosthesis for War Injuries, J.A.D.A. **35**:634-644 (November 1) 1947.

# *Status Lymphaticus. Thymic Death and Anesthesia in Oral Surgery*

**SEYMOUR ZEFF, D.M.D.**

In 1889, Paltauf[1] drew attention to cases of sudden, unexplainable deaths occurring among infants who were found on postmortem examination to have general hyperplasia of all lymphatic structures. No conclusive evidence of the cause of this puzzling condition has since been reached although it has been shown that persistence of the thymus is but one of a combination of hereditary anomalies present.

*Definition*—1. Status lymphaticus appears to be a combination of constitutional and anatomic anomalies with certain peculiarities of (1) configuration, (2) preservation, or (3) hyperplasia of the thymus at an age when involution would be expected. 2. The lymphoid cells in the spleen, intestines, and elsewhere may show hyperplasia. 3. Hypoplasia of the vascular system, underdeveloped genitalia, and other occasional defects occur.

*Manifestations*—1. The chief manifestation attributed to status lymphaticus is sudden death occurring without obvious cause, during anesthesia or following such minor procedures as (1) hypodermic injection, (2) extraction of teeth, (3) fracture, or (4) psychic shock.

2. The concept of status lymphaticus does not necessarily imply that death or other symptoms are due to pressure from an enlarged thymus.

3. Sudden death in status lymphaticus is relatively rare. In a series of over 1,500 autopsies performed, status lymphaticus occurred 249 times or 6.2 per cent.

## *Enlargement of the Thymus*

1. It is erroneously believed by many practitioners that death is due to enlargement of the thymus with subsequent mechanical asphyxiation.

2. Enlarged thymus glands may exist and in children the gland may

(*Continued on page* 184)

[1]Paltauf: Wien. klin. Wchnschr. **2**:877, 1889.

# *Reduction of* MANDIBULAR FRACTURE *with Direct Wiring*

JOSEPH E. SCHAEFER, M.D., D.D.S.
and RALPH C. RUDDER, M.D., D.D.S., Chicago

## DIGEST

***This case illustrates the gratifying results obtained in a mandibular fracture by the open reduction technique, where it was impossible to reduce and fix the fracture successfully by means of intermaxillary wiring or external pin fixation. It is to be noted that fibrosis and callous formation were present at the time of consultation.***

### *Case History*

A well-developed, well-nourished boy ten years of age, was admitted to the hospital following an automobile accident.

*Present Condition*—1. Examination at this time revealed a restless, acutely ill patient suffering (1) from shock, and (2) from acute craniocerebral trauma.

2. On further examination (1) a fractured right femur, and (2) a bilateral fracture of the mandible with a four-inch laceration over the right orbit were found.

*Physical Examination*—1. The chest was clear and resonant without dullness to percussion. 2. Tachycardia was present with sinus rhythm and no murmurs.

*Laboratory Examination*—Coagulation time, two minutes; red blood cells, 4,700,000; white blood cells, 14,000; hemoglobin, 80 per cent; polymorphonuclears, 82 per cent; lymphocytes, 18 per cent.

*Urinalysis*—Reaction acid; specific gravity 1.031; albumin, sugar, epithelial cells, and casts, negative.

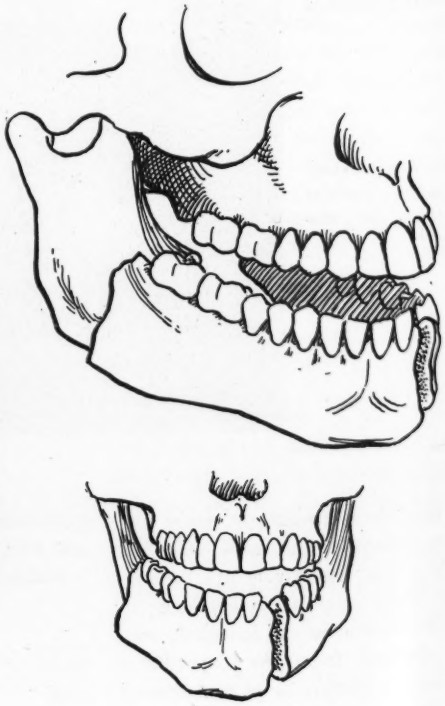
Because of the acute craniocerebral trauma, consultation for oral surgery was not requested until ten days after admission to the hospital. At this time the patient appeared irrational and was in Buck's traction.

### *Oral Examination*

1. A bilateral compound fracture of the mandible with marked displacement and over-riding of segments at the fracture sites were revealed by oral examination.

2. X-ray examination disclosed

**1.** *Roentgenogram showing fracture at right angle of mandible with marked over-riding of the ramus and upward displacement in relation to fractured fragment.*



**2.** *Diagrammatic representation of the fracture problem.*

(1) a fracture at the right angle of the mandible and through the cuspid area on the left side, with (2) marked over-riding of the ramus and downward displacement of the entire intermediary fragment from the angular break to the left cuspid area (Figs. 1 and 2).

Because of the craniocerebral trauma, it was deemed advisable to postpone reduction and fixation for a few days before attempting surgical interference.

## Technique

1. Intermaxillary wiring with elastic traction was then attempted, but was unsuccessful in reducing the fracture because of fibrosis at the fracture sites.

2. On the following day, open reduction and fixation of the fracture were performed.

3. A two-inch incision was made at the right angle through the skin and superficial fascia, and the masseter muscle was detached from the mandible at the fracture site, exposing the bone.

4. An orthopedic drill was used in placing a hole at each side of the fracture site, and 23-inch gauge stainless steel ligatures were used to reduce and fix the fracture.

5. Deep catgut was used in closing the musculature layer, and black silk sutures to close the skin.

6. A similar procedure was used in the reduction of the fracture at the left mental foramen where marked fibrosis at the site of fracture was bluntly dissected before reduction could be performed.

## Conclusion

1. Following reduction at the fracture sites, the mandible was immobilized with intermaxillary wiring for the following six weeks.

2. The sutures were removed on the fifth postoperative day.

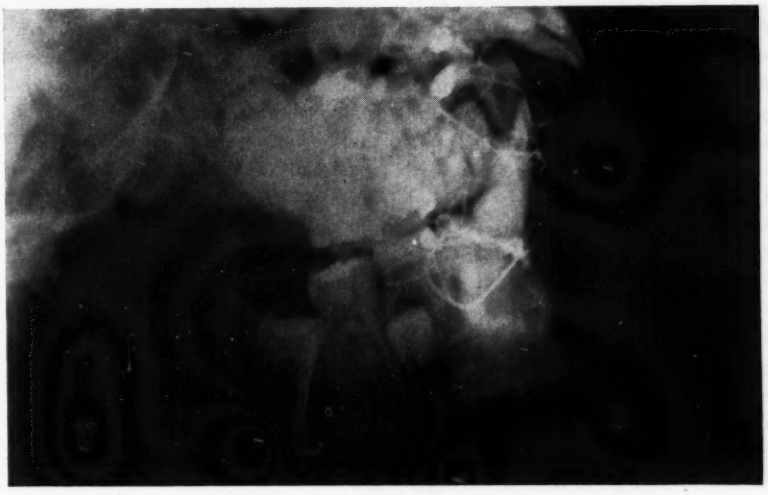
3. X-rays taken following reduction revealed good alinement of the fracture segments (Figs. 3 and 5).

4. Recovery was uneventful and the patient was discharged from the hospital twenty-three days after entrance.

804 *West 79th Street.*

25 *East Washington Street.*

**3.** ***Roentgenogram showing correction of alinement of right angle fracture and left mandibular fracture.***



**4.** ***Roentgenogram showing good alinement of fractured angle with correction of over-riding.***

**5.** ***Note good position of displaced fragment from angular fracture to fracture in area of mental foramen***

# PREOPERATIVE SUTURING

## *in Oral Surgery*

MONTAGUE A. CASHMAN, D.D.S., Washington, D.C.

**DIGEST**

***One of the difficulties in oral surgical procedures is suturing. (1) A surgical procedure may have been performed with great skill, (2) debridement of the area may have been scrupulously performed, and (3) all situations pertaining to an ideal postoperative result may be present. However, all the success gained in the previous procedures may be destroyed in the final step of suturing.***

***The following technique for suturing has been devised by the author and has been applied successfully in numerous cases in the oral surgery department of an army hospital and in personal practice. The difficulties involved in suturing have been found to be greatly reduced by the method described and the results have been gratifying.***

### Results of Improper Suturing

Unsatisfactory postoperative results are not representative of all operative procedures in the mouth but in numerous instances (1) areas of denuded bone, or (2) deeply exposed roots are present following surgical procedure.

*Subjective Symptoms*—When an area of bone has been exposed, there is the subjective symptom of pain varying from mild to severe, depending on (1) the amount of exposure, and (2) the length of time which has elapsed since the surgery was performed.

*Exposure of the Bone*—If the exposure is along the line of incision, the following conditions may be present: 1. The flap of tissue which should have been held in place by proper suturing may be completely detached, exposing a large area of bone. 2. A small part of the flap may have remained intact with the result that there is only a small, but nevertheless potentially dangerous, exposure.

*Repair May be Necessary*—1. If the suturing which has failed rests directly over the ridge, or has failed to hold the buccal flap which had been made for the removal of a deeply impacted third molar, undesirable conditions are often the result.

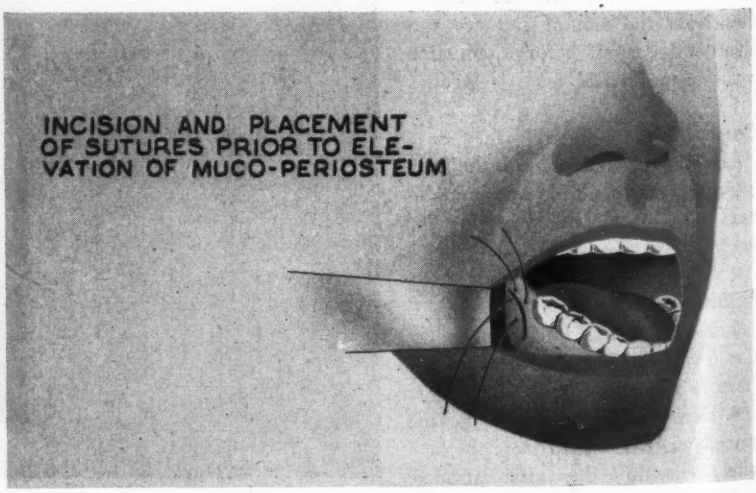
2. Where an alveolectomy has been performed, a deep, slowly granulating socket or series of sockets, may result with a plastic repair necessary if the primary purpose of the alveolectomy, rapid healing of the area, is to be achieved.

*The Occurrence of Dry Socket*—In the author's opinion, dry socket is more commonly caused by improper holding of the incision over an impacted third molar than is generally believed. A substantial blood clot requires four walls as a matrix for proper architectural resolution. If one wall of the matrix is removed, (1) deformity, or (2) dry socket will result. The latter is produced by the failure of the tissue matrix to retain the blood clot. Exposure of the underlying and surrounding bone, therefore, occurs.

### Operation Requires Skill

Suturing in the mouth is often considered more difficult than suturing in any other part of the body. In suturing of blood vessels and in delicate suturing procedures of the eye the highest degree of skill is required.

*An Important Condition*—The most important condition; namely, suitable access, is absent. Satisfactory access is as important in the procedure of suturing as it is in the operative procedure itself.




**1.** ***Incision and placement of sutures prior to elevation of mucoperiosteum.***

*Nature Unreliable*—In many instances the operator relies upon nature and normal granulation to fill in an area which he finds impossible to suture (1) because of poor access, or (2) because the tissue has been too mutilated to receive one or more sutures.

## Technique

1. The line of incision is made exactly as before, but elevation of the mucoperiosteum is postponed.

2. Instead of being the last step, the placement of untied sutures becomes the second step.

*Suture Material*—The choice of the suture material is left to the operator although the author finds Number 80 white cotton most suitable to this technique. It has been found that tissue tolerance in the mouth for this material is ideal.

*Method*—1. Cut the suture in fairly long pieces (about 8 to 10 inches in length).

2. The suture needle is inserted on one side of the line of incision and out through the opposite side, making sure (1) that the underlying periosteum is well engaged, and (2) that the points of insertion and emergence are between 1 and 2 millimeters from the edge of the tissue. This ensures that the tissue is not torn by the ensuing operative procedures.

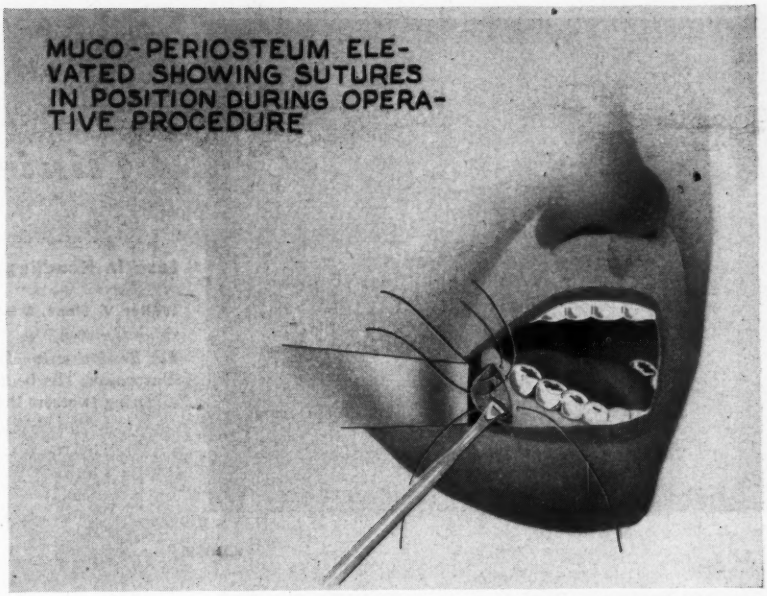
*Placement of Sutures*—1. All the necessary sutures are placed in the manner described, the operator deciding how many will be necessary for proper closure after the operative procedure has been completed (Fig. 1).

2. None of the sutures is tied at this time.

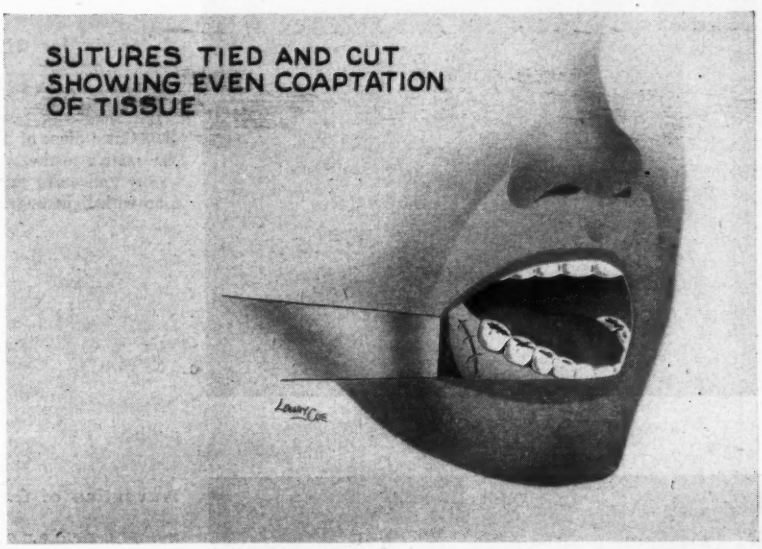
3. The sutures are left open with their free ends draped away from the area in order not to interfere with the actual surgery (Fig. 2).

4. The second step involves the raising of the mucoperiosteum to uncover the underlying bone. This is done in the usual manner, the only additional precaution being that the margins of the tissue are not cut through by tension on the tissue.

5. After the surgery is completed and debridement has been accomplished, the flap is gently brought back into position by mild tension on each end of the suture and tied with the usual surgeon's knot (Fig. 3).




**2.** ***Mucoperiosteum elevated, showing sutures in position during operative procedure.***




**3.** ***Sutures tied and cut, showing even coaptation of tissue.***

## Summary

1. The original relationship of the tissue is maintained because the sutures are placed before the mucoperiosteum has been elevated.

2. Collapse of freshly constructed ridges is eliminated.

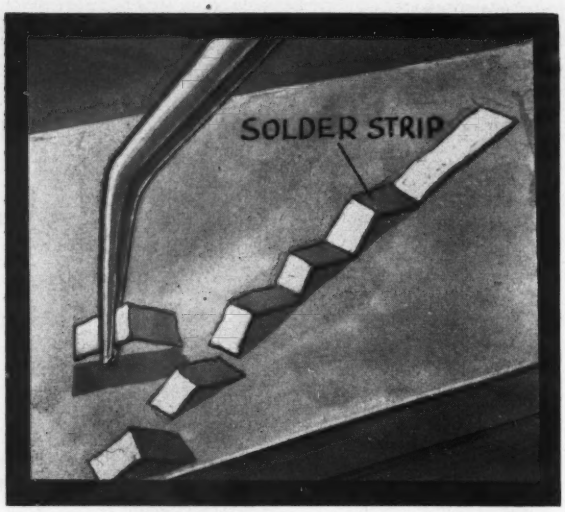
3. The danger of an ensuing dry socket is decreased.

4. Denudation of roots proximating the operative area is reduced to a minimum.

5. The tension involved in suturing in difficult areas is alleviated.

6. The author uses this technique routinely in all areas where access is difficult and multiple sutures are required.

2000 *Connecticut Avenue, N.W.*



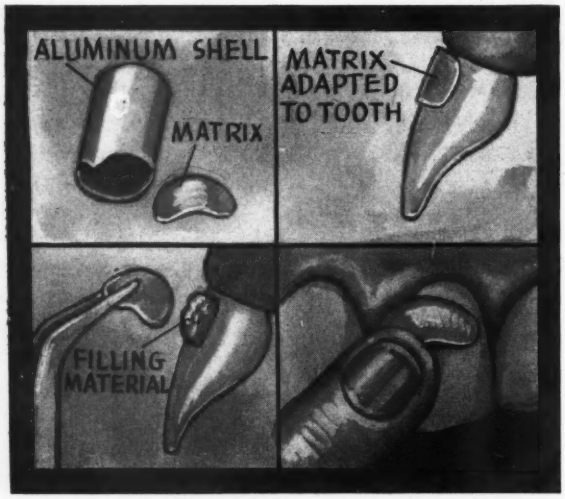

1

# *Clinical and Laborato*

### Ease in Handling Solder

**Walter V. Stone, D.D.S., Topeka, Kansas**

**1.** Bend a strip of solder and cut into pieces as shown in the illustration. The bent pieces may be more easily grasped with the soldering tweezers than if they were flat pieces.




2

### A Matrix for Gingival Plastics

**A. Gittelson, D.D.S., Brooklyn, N.Y.**

**2.** Cut a piece of matrix material from an aluminum shell. Adapt the matrix to the tooth contour. Place the plastic material in the cavity and carry the aluminum matrix to position. Hold in position with light finger pressure.

3

### Prevention of Gagging During X-ray Procedures

**Hyman I. Falk, D.D.S., Brooklyn, N.Y.**

**3.** When the patient opens his mouth for the insertion of the film, have him hold his nose very tightly with his thumb and index finger. Place the film in position and have the patient hold it with the index finger of the other hand.

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For every practical clinical or laboratory suggestion that is usable, DENTAL DIGEST will pay $10.00 on publication.

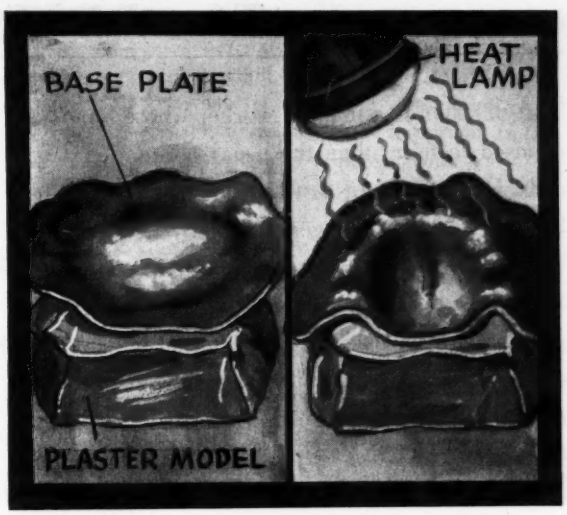
You do not have to write an article. Furnish us with rough drawings or sketches, from which we will make suitable illustrations; write a brief description of the

# SUGGESTIONS . . .

### Infra-red Heat Lamp to Adapt Baseplates

Robert L. Roeser, D.D.S., Saginaw, Michigan

**4.** Place the baseplate over a plaster model and turn on an infra-red heat lamp. The heat from the lamp will soften the baseplate more uniformly than will a direct flame.

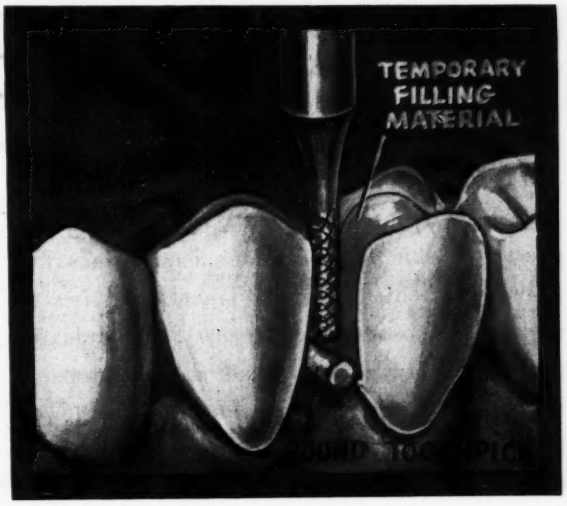



4

### An Aid in Using Temporary Cement

Seymour C. Scheinbach, D.D.S., New York

**5.** Place the tapered end of a round toothpick in the interproximal space at the gingival margin of the cavity preparation. Insert the temporary filling material. When the temporary filling is removed, the bur will strike the toothpick rather than the soft tissue.

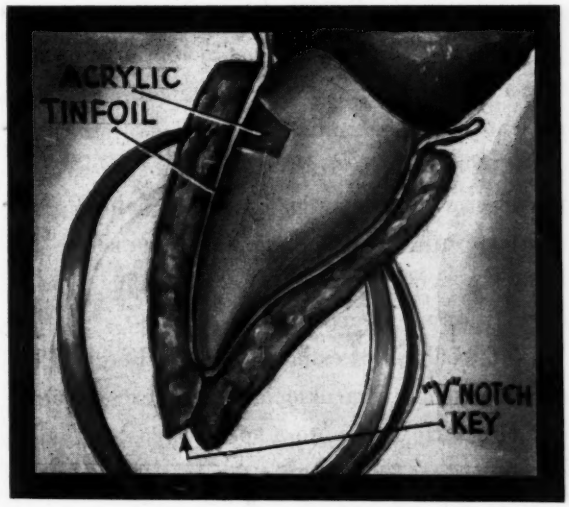



5

### A Positive Pressure Matrix for Acrylics

Samuel Stein, D.D.S., Poughkeepsie, N.Y.

**6.** After the cavity is prepared, restore the contour of the tooth with temporary stopping. Cover the lingual surface of the tooth and the approximating teeth with plaster to a thickness of ½ inch. When the plaster has set, remove and trim to a sharp edge at the incisal and cut a V-notch for a key. Replace, and cover the labial area with plaster. Remove, adapt tin foil to the tooth surfaces of both sections. After the acrylic is inserted in the cavity, cover the tooth with the plaster matrix and hold in position with a cervical clamp.




6

technique involved; and jot down the advantages of the technique. This shouldn't take ten minutes of your time.

Turn to page 180 for a convenient form to use.

Send your ideas to: Clinical and Laboratory Suggestions Editor, DENTAL DIGEST, 708 Church Street, Evanston, Illinois.

# The EDITOR'S Page

THE DENTIST is a manual worker whose hands are exposed to more than the usual occupational hazards. He is required to wash his hands frequently, he handles chemical agents that are often irritants, he works in a contaminated environmental field. Should he develop a dermatitis on his hands his productivity may be deeply curtailed or altogether destroyed. People are not disposed to patronize dentists with inflamed and sore looking hands. They are not anxious to have such members thrust into their mouths!

In an unusually clear and practical article, Traenkle[1] discusses some of the common dermatologic diseases that affect dentists. The simplest is eczema of the hands that is due to friction: "usually through the means of constant washing, rubbing, and wiping of the hands with rough towels many times a day." Another element of irritation is the alkali from soap. If a brush is used, a further insult is given to the skin. In the case of a dentist who suffers from eczema of the hands, Traenkle advises the use of soap substitutes (detergents), the elimination of the hand brush except where surgical asepsis is required, and the use of soft absorbent hand towels. Coarse paper towels and hand towels that contain caustic laundry chemical residuals are irritating.

In addition to the alkali in soap, the dentist's hands may be irritated from antiseptic, strong acids, and sterilizing solutions. Although accidental injuries from penetrating wounds with burs and cutting instruments are not dermatologic diseases, they present more than a minor occupational hazard because of the danger from infection that rises from working in the contaminated mouth field. Permanent and serious late radiation sequelae may result from the dentist holding the x-ray films himself during routine diagnostic procedures.

On the subject of external contact allergy of the dentist's hands, Traenkle makes an exceptionally clear case. He refers "to a specific sensitization to some particular substance externally contacted. This is not to be confused with allergic responses to internal substances." Minute and invisible quantities of the allergen may precipitate the allergic reaction. Among the sensitizers are the "caine" local anesthetics; chromic acid and its compounds, including chromates in steel and alloys; mercury and all mercurial substances; the plastics; the resins of gutta percha; the metals (nickel, silver, tin); the so-called cold sterilizing solutions; rubber gloves; rubber dams; adhesive tape; x-ray films and processing solutions.

Although eczema due to primary irritation (friction, soap, brushes, rough towels) is usually confined to the hands, the dermatitis produced by contact allergy may not be localized to the hands. The skin about the eyelids, neck, and other parts of the body may become involved by unconscious hand transfer of the offending allergen to these parts.

The persistence and chronicity of hand dermatitis is described by Traenkle:

"An eczema may start off being essentially of an allergic type, but continue on even though the original contact substance is removed. This perpetuation may be due to subsequent contact with primary irritants which keep stimulating the eczematous response. For instance, a dentist develops a dermatitis due to pontocaine, which subsequently is eliminated from his environment. However, he is very apt to keep on washing his hands with soap before the eruption has had time completely to subside. Under such conditions the eczema frequently does not clear up, but continues and may even become worse. Thus one has a conversion of a contact external allergic eczema into one primarily due to irritation. The reverse may also take place. The eczema may have started due to primary irritation and later various allergies develop."

A further hazard springs from the superimposition of an infection with oral staphylococci and skin about the eyelids, neck and other parts of the

[1]Traenkle, Herbert L.: Dermatologic Diseases Affecting the Dentist, New York State Dent. J. **16**:76 (February) 1950.

# MEDICINE and the Biologic Sciences

## Nervous Indigestion

The term "nervous indigestion" is somewhat ambiguous. It implies a condition of indigestion associated with nervousness but this is usually not the case as the trouble is not all nervous and the indigestion is not a true indigestion.

The complaint is quite common as more than one half of the patients coming to the physician with abdominal complaints have no organic basis for their distress. The early symptoms of many diseases are similar to those of nervous indigestion. It is important to look for organic disease in order to institute the proper treatment as soon as possible.

The symptoms are greatly varied in type and severity. (1) Heartburn, (2) belching, and (3) excessive fullness while eating or after eating are common. Also generalized or shifting abdominal pain, usually located below the navel, is frequent. This is commonly relieved by defecation or flatus. Excessive flatus with rumbling and gurgling noises in the abdomen is not infrequent.

Usually the person gives a history of a condition which he believes to be constipation. Generally, he means that in order to have a bowel movement daily, or after each meal, or whatever his concept of normal bowel function may be, it is necessary for him to take a daily laxative or at least one every other day, or large enemas at frequent intervals.

Relatively few patients with functional bowel distress pass regularly well-formed stools. True constipation is rarely seen in these persons.

Physical examination usually demonstrates a tender colon, particularly in the sigmoid and the transverse portions. This finding, in addition to the distress and the history of disturbed bowel function, completes the clinical picture of the condition.

In diagnosing the condition many organic diseases are eliminated by examination, studies, and analyses. X-ray examination of (1) the chest, (2) gall bladder, (3) esophagus, (4) stomach, (5) duodenum, and (6) terminal ileum and colon (barium enema) should be done almost routinely in this group of patients. The tests do not in themselves provide a diagnosis of nervous indigestion, but the demonstration of normal structures is compatible with the diagnosis and provides some of the reassurance needed by the patient as an important part of his therapy.

The treatment of nervous indigestion begins with the anamesis and continues through the various examinations. The physician studies the reactions of the patient and attempts to evaluate his personality. The abdomen has long been regarded as the "sounding board of the emotions." However, it requires keen observation to detect actions and reactions when relating the body to the abdomen.

Diet therapy is important. However, its importance is not to be overstressed. The goal of diet therapy is to provide food which will (1) maintain proper nutrition and (2) supply the correct amount of stimulation for the bowel.

The chief difficulty, as a rule, is not in regulating the bowel, but rather in re-educating the patient as to what is a normal and desirable bowel function. The number of bowel movements per day, week, or month is not important provided the consistency is satisfactory. The amount of fecal material is also not important. In fact, the more complete, and hence the more perfect, the process of digestion, the less the amount of residue to be expelled as feces.

Medication is of secondary importance. Antispasmodics, such as belladonna are of some value. It may be conveniently prescribed as the extract 1/8 to 1/4 of a grain three or four times per day. Sedatives may be helpful for their general effect and also because of their quieting action on the bowel.

It has been stated that nervous indigestion is, in a sense, a warning signal of a personality in distress. The correct evaluation and treatment is partly a work of science and partly a work of art.

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*Palmer, Walter Lincoln: Nervous Indigestion, J. Michigan M. Soc.* **48**:1264-1266 (*October*) 1949.

## Antihistaminics in Tuberculosis

Primary tuberculosis is characterized by relative benignity and the absence of tissue destruction. However, these characteristics are reversed in the reinfection or secondary phase. As the large number of cases arise from reinfection, it is important that steps be taken to avoid reinfection.

It is believed that the destruction noted in the secondary phase is due in some degree to hypersensitivity to an antigen developed during the primary phase. On reinfection or spread of the bacilli from a primary site, there occurs an inflammatory reaction characterized by exudation.

If this acute inflammation could be prevented it seems possible that antihistaminic drugs might protect sensitized cells from injury. Thus the course of the disease would be altered.

Benadryl, pyribenzamine, theophorin, and neohetramine have been tried in a number of cases. A variety of cases was included. The greatest

improvement occurred in patients with tuberculous pneumonia and other acute exudative lesions which seemed to be the result of hypersensitivity.

The antihistamine drugs become less effective as the lesions progress in chronicity. The clinical improvement accompanying the administration of the antihistaminics strongly points to the therapeutic effectiveness of these drugs even though improvement lasted only during the administration. The combined administration of antihistaminics to suppress the allergic components of the disease and of streptomycin to suppress the growth of the bacillus is being carried out with encouraging results.

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*Judd, A. R., and Henderson, A. B.: Use of Antihistaminic Drugs in Human Tuberculosis: Preliminary Report, Ann. Allergy* **7**:329-334 (*May-June*) 1949.

## *Food Allergy*

Considerable attention has recently been given food allergy in both the medical and the lay press. There are clearly defined instances where ingestion of a particular food produces an unmistakable allergic response in certain persons. These reactions are usually recognized without difficulty.

Atypical signs, (1) unexplained headache, (2) fatigue, (3) muscle pains, (4) depressed spirits and (5) slight changes in the leukopenic index have in many cases been regarded as allergic responses to some constituent of the diet. Such symptoms are not generally considered a reliable basis for a diagnosis of allergy although these signs and symptoms are sometimes so interpreted. As a result, the idea has been advanced that cereals, notably wheat and corn, are major causes of food allergy. Not only has the crude protein-containing flour been implicated but also its refined products.

It has been suggested that corn starch and corn sugar are particularly menacing because of their inclusion in a wide variety of unsuspected articles such as milk cartons, frozen food containers, and excipients. Some pediatricians state that corn syrups and dextrose may sensitize the bottle-fed infant.

The avoidance of all oils, sugars, and starches by those occasional patients who are allergic to the unrefined sources of these foods has been advocated. This concept is perhaps premature as the criteria upon which these beliefs are based have not been generally accepted. The customary cutaneous tests are not entirely reliable for the diagnosis of food allergy.

Development of such subjective symptoms as headache, chilliness, and fatigue after the feeding of a frankly suspected test meal are not sufficient to convince the average physician that a state of allergy exists. Any new regimen, including the elimination of suspected foods from the diet, may bring temporary relief. A minimal diagnostic requirement should be reproduction in the patient of his symptoms on more than one occasion when the suspected food is included in a test meal unknown to the patient. Also he should be given control meals lacking the food under suspicion.

Experiments with laboratory animals have not established the antigenicity of sugars, starches, and oils. Neither have anaphylactic antibodies been provoked by their deliberate administration. Dextrose has been given to man, even by the intravenous route, without evidence of anaphylaxis.

Therefore, it seems advisable to be cautious at the present time in judging refined foods as a dangerous threat to the patient with allergy.

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*Editorial: Allergy to Refined Foods Products, J.A.M.A.* **141**:847-848 (*November* 19) 1949.

## *Pernicious Anemia*

The incidence of pernicious anemia is greater than most persons realize. In the majority of cases, the patient in relapse may arrive in the physician's office or in the hospital with an erythrocyte level of 3 million per cubic millimeter or less. The disease rarely produces enough symptoms to bring the patient to the doctor before this level is reached.

On the other hand, the patient with pernicious anemia may actually walk into the physician's office with a red blood cell count of well under 1 million per cubic millimeter. He may actually deny many symptoms of ill health. However, once the diagnosis of pernicious anemia is made or even suspected, the prompt institution of specific therapy should be initiated.

For the patient in relapse, maximal therapeutic effects can be achieved by the intramuscular administration of 30 U.S.P. units of liver extract daily for three days. This is followed by weekly injections until the erythrocyte and hemoglobin levels have reached an essentially normal value. At this point the patient is placed and kept on a maintenance schedule.

Maintenance therapy should be simplified as much as possible. In general, the uncomplicated case of pernicious anemia requires the equivalent of 1 U.S.P. unit per day and at intervals of four weeks a maintenance dosage of 30 U.S.P. units of liver extracts intramuscularly. The interval of four weeks is adequate for (1) the alleviation of symptoms, (2) the insurance of a satisfactory blood level, and (3) the prevention of combined system disease. It also aids in keeping the patient's morale up as well as keeping him on a regular schedule of treatment. At intervals of three to four months the patient should be examined clinically and the blood level determined by means of estimation of the hemoglobin.

A small proportion of persons under treatment develop a sensitivity to liver extract. The most frequent manifestations consist of (1) generalized itching, (2) urticaria, (3) edema of the face and (4) nausea. Usually such sensitivity can be handled in one of two ways, (A) by the omission of all liver extracts for two months, or (B) by administration of one of the antihistaminic drugs sixty to thirty minutes prior to the administration of liver extract.

For the majority of patients folic acid offers no advantage over liver extract. Folic acid may not only fail

to prevent the development of combined system disease but may actually induce the development of the complication. It is not wise to recommend the general use of many of the commercial preparations of vitamin B complex which contains small amounts of folic acid. In those persons with early pernicious anemia the small amount of folic acid may be just enough to mask the early symptoms and early hematologic changes.

Vitamin $B_{12}$, the active agent in liver extract for the treatment of pernicious anemia, has been isolated. It is producing excellent results. However, the dosage of vitamin $B_{12}$ required for maintenance of patients over a long period of time is unknown. The protective action of the vitamin against the development of combined system disease over a long period remains undetermined.

The present-day treatment of pernicious anemia relieves the patient of most of his symptoms, restores the blood to a normal level, and prevents the development of combined system disease. However, it does not restore the ability of the stomach to secrete free hydrochloric acid, nor prevent the usually terminal complication of carcinoma of the stomach.

It is estimated that in persons over 45 with pernicious anemia the incidence of carcinoma of the stomach is 12.3 per cent. This incidence can be expected to rise with the increasing longevity of patients with pernicious anemia. Optimal care of the patient with pernicious anemia should include periodic roentgenologic examination of the stomach.

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*Jacobson, Bernard M.: The Treatment of Pernicious Anemia, M. Clin. North America* **33**:1385-1400 (*September*) 1949.

## Should a Patient With Heart Disease Fly?

Air travel is becoming more and more popular. Likewise, the incidence of heart disease is apparently increasing. It is, therefore, logical that some consideration be given to both in their relationship to one another.

Aviation medicine adheres to the axiom that if it is safe for a patient with heart disease to walk (meaning that compensation is well established) it is equally safe for him to fly. This is true, provided he is willing to take the supplemental oxygen kept aboard should signs and symptoms of anoxic discomfort arise during the flight.

On the pressurized-cabin type of plane the occasional need for the administration of oxygen to such persons has almost reached the vanishing point. A physician can now exercise a choice and advise his ambulatory patient to use the pressurized-cabin type of air transportation with every assurance that the patient will complete the flight in comfort and safety without having to resort to the use of oxygen. Oxygen should still be aboard and immediately available at all times for use in an anoxic emergency.

No airliner is so completely pressurized as to maintain sea-level pressure in the cabin at all cruising altitudes during flights. A plane with pressurized cabin can be flown at altitudes around 15,000 or 16,000 feet with a "cabin altitude" around 5,000 feet. This altitude exposure, which can be anoxic, is about that of Denver.

Although paroxysmal auricular fibrillation can occur aloft just as it does on the ground, nothing in the flight itself, with the safeguards mentioned, should predispose a person to fibrillation. As a matter of precaution, a person with heart disease should be advised not to engage passage on any type of airliner that does not have a supply of oxygen aboard for use by passengers who may need it in an emergency regardless of the "cabin altitude" to be flown.

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*Queries and Minor Notes, J.A.M.A.* **141**:1108 (*December* 10) 1949.

## Rabies Control

An alarming increase in rabies in many parts of the country has been recorded during the past fifteen years. Each year over 30,000 persons are required to take the long and often painful vaccine inoculations as a result of exposure to rabid or suspected dogs. The annual cost to the country for human vaccine treatments and livestock losses exceeds $5,000,000.

To eradicate the disease in the United States the United States Public Health Service is striving to establish a nation-wide uniformity of control procedures with the Rabies Control Branch, Veterinary Public Health Division. This branch serves as a nerve center for rabies control.

The local rabies control program includes three measures:

1. The impounding and destruction of all stray and ownerless dogs.
2. Annual antirabies vaccination of all dogs. The importance of canine vaccination is now firmly established and needs only an educational campaign to bring this fact to the public.
3. Registration or licensing of all dogs.

Except in heavily populated cities, vaccinated dogs, when properly tagged, may be allowed to run at large thirty days after vaccination. The vaccine is not fully effective until the end of that time.

In an outbreak of rabies a strict quarantine should be placed on all dogs requiring that they should be confined at home or kept on a leash when out of doors. Dogs under six months of age are particularly susceptible to rabies and are not as readily immunized as adult dogs. They should be confined. Biting dogs and suspected animals should be impounded and held under observation for twelve to fourteen days. Dogs exposed to rabies should be destroyed or kept confined under observation for six months.

In case of rabies outbreak in wild animals, such as foxes, adequate trapping programs should be instituted.

Diagnostic facilities and human antirabies vaccine should be made available by the local health unit or branch laboratory of the state health department. All cases of rabies in human beings and animals should be reported to the local health officials.

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*Steele, J. H., and Tierkel, E. S.: Rabies Problems and Control: Nationwide Program, Pub. Health Rep.* **64**:785 (*June* 24) 1949.

# Protein Comes Into Its Own

JAMES S. McLESTER, M.D.

THE DEVELOPMENT of the science of nutrition presents a constantly changing picture. This development can be divided roughly into five periods, all culminating today into a greater appreciation of protein.

## The Energy Era

Almost all of the fundamentals of metabolism was established by the pioneer students in a time when enormous interest was focused on that subject. These research workers discovered the following fundamentals in metabolism:

1. The law of the conservation of energy is applicable to nutrition.
2. The nitrogen of the urine can be taken as a measure of protein destruction.
3. Nitrogen equilibrium can be maintained by an appropriate diet.
4. Muscle work does not appreciably increase protein metabolism.
5. Under given conditions food stuffs may replace each other in accordance with their caloric value (the isodynamic law.)
6. The heat value of basal metabolism is proportional to surface area. In the study of metabolism prime consideration was given to energy exchange, and attention to calories came first.

## Adequacy in Diet

Notwithstanding the wealth of information concerning the harmful effects of starvation uncovered by the investigators of the nineteenth century, physicians of the early years of this century continued to give little thought to the nutritive requirements of the sick person. They told the patient what he must *not* eat, not what he *must* eat.

*Diet for the Typhoid Patient*—Only a few ounces of milk and a little broth were given typhoid patients and some physicians did not believe in giving milk. Fear that an increase in the amount of food would (1) injure the intestinal ulcers and (2) bring the fever to a higher level continued among many physicians until it was effectively disposed of by the studies of Coleman and DuBois.[1]

The use of a more liberal diet in the treatment of typhoid had the following gratifying results:

1. The so-called typhoid toxemia was eliminated.
2. The frequency of complications was lessened.
3. The period of illness was shortened.
4. Much of the resulting disability was relieved.
5. The mortality was greatly reduced.

*Treatment of Patients with Peptic Ulcer*—The discarding of the starvation diet was an improvement in the treatment of peptic ulcer. Although the regimen devised by Sippy[2] did not provide enough food according to today's opinion, its adoption was a distinct advance in the treatment of peptic ulcer.

From such experiences physicians learned that hardly anything can be cured by starvation and a more liberal diet is provided in the treatment of many diseases.

## The Era of Economy in Nutrition

Many physicians were prone to ascribe almost every ill to protein decomposition products absorbed from the intestinal tract. Experiments were conducted which seemed to prove that economy in nutrition promoted well-being. Many adherents to this belief were found in the medical profession and the general public.

*Faulty Experiments*—1. Attention was called to the fact that the experiments were carried on for a relatively short period of time.

2. Damage reported to occur to the kidneys and arteries as a result of a high protein diet with animals could not be wholly ascribed to the protein quota of the diet because the rations used were defective in other respects.

3. There was little evidence of true nephritis in animals maintained on high protein diets. The animals lived to maturity, were long-lived, healthy, and normally fertile.

4. The intake of protein in such experiments was in most instances enormous, much greater relatively than civilized man ever takes which would rule out the applicability of the animal experiments to man.

*Experiments on Man*—In his life in the Arctic Stefansson[2] became enthusiastic over the virtues of an exclusive meat diet. His physician[3] reported that during Stefansson's eleven and one-half years in the Arctic Circle for long periods he subsisted solely on meat and that while on this diet he experienced the highest degree of physical and mental well-being.

2. The Eskimos of northern Labrador and Greenland who lived on an exclusively carnivorous diet showed no unusual prevalance of vascular or renal disease.

3. Much evidence has accumulated to dispose of the fear entertained by many physicians that protein was responsible for "intestinal autointoxication."

## The Vitamin Era

The most colorful era of all, the vitamin era, was introduced when it was found that an animal cannot live on purified diets alone. Through many successive steps this era came into full development:

1. Widespread interest in vitamins apparently began in 1913 when McCollum and Davis[4] observed that

[1]Coleman, W., and DuBois, E. F.: Clinical Calorimetry: VII. Calorimetric Observations on the Metabolism of Typhoid Patients With and Without Food, Arch. Int. Med. **15**:887 (May) 1915.

[2]Stefansson, V.: Observations on Three Cases of Scurvy, J.A.M.A. **71**:1815 (Nov. 23) 1918.

[3]Lieb, C. W.: Effects of an Exclusive, Long-Continued Meat Diet Based on the History, Experiences and Clinical Survey of Vilhjalmur Stefanson, Arctic Explorer. J.A.M.A. **87**:25 (July 3) 1926.

[4]McCollum, E. V., and Davis, M.: The Necessity of Certain Lipins in the Diet, J. Biol. Chem. **15**:167, 1913.

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young animals restricted to a diet of purified casein, starch and lard, with an appropriate salt mixture, would not grow unless butter fat or egg yolk were added to the ration.

2. Other experiments with similar diets reported that (1) not only was growth retarded in the young, but (2) a characteristic disease of the eye developed in the older animals.

3. Research pointed to the existence of an important principle which is essential to growth, a fat-soluble factor, for which McCollum suggested the name vitamin A.

4. Water-soluble vitamin B was split into its component parts.

5. Another water-soluble vitamin which was subsequently isolated from lemon juice became known as vitamin C.

6. In 1922, through the work of McCollum and his associates, vitamin D came into recognition and the discovery of many other vitamins followed.

*Deficiency Diseases*—When it was found in 1937 that black tongue in dogs, the analogue of pellagra in man, can be cured with nicotinic acid great impetus was given to the study of deficiency diseases. An entirely new area of nutritional investigation was opened up.

*Conservative Tendencies*—1. It is recognized by nutritionists that if a person is well nourished and his vitamin equipment adequate no nutritional benefit will result from taking additional vitamins.

2. Men should, as a rule, take his vitamins in the form of natural foods. For the maintenance of robust health these substances should be secured, not from the pharmacist but from the grocer and the dairyman.

### The Protein Era

1. About ten years ago it was demonstrated by experiments with rats that (1) ten of the known twenty-two amino acids are indispensible and (2) it is possible to maintain life in the rat when a suitable mixture of amino acids is the only source of nitrogen.

2. It is a question whether a mixture of pure amino acids can completely replace the protein of the diet for there is evidence suggesting the need under certain conditions for accessory factors which are themselves derived from the protein molecule.

*Protein in the Metabolism*—Older concepts of the part played by protein in the metabolism of the body must be radically revised: 1. Proteins are not fixed parts of a permanent structure but are labile substances in a constant state of change. 2. It has been shown that proteins are not held in the manner that fats and carbohydrates are stored in the body but instead, exist in a highly mobile state in which their fractions are in a constant state of change.

*The Value of Protein in Pregnancy*—1. A generous serving of meat given daily to pregnant women in addition to their chosen diets has been shown to be effective (1) in increasing hemoglobin and red cell concentration and (2) in avoiding edema and promoting lactation.

2. By means of roentgenograms it has been shown that proper osseous development at birth depends to a


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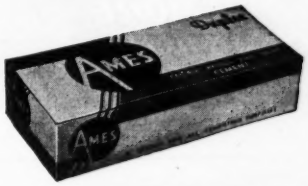


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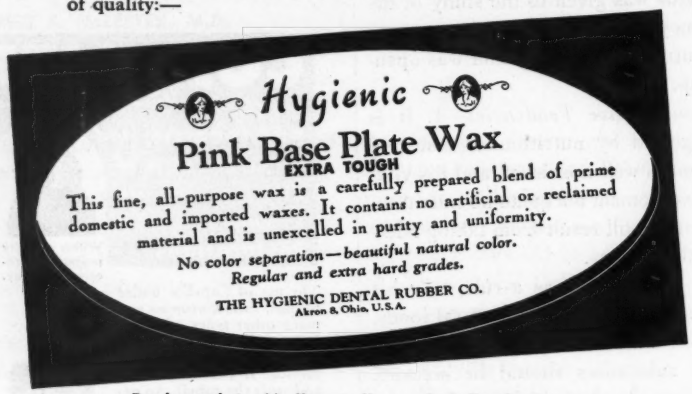
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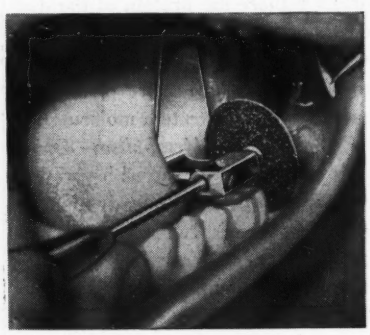

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large degree on the suitability of the mother's diet and that protein is a factor in determining the adequacy of this diet.

*Protein in Resistance to Infection*—Accumulating evidence indicates that protein plays a fundamental role in the maintenance of both natural and acquired resistance: 1. It has been observed that a direct relationship exists between the amount of protein consumed and the efficiency of phagocytic activity.

2. It has been demonstrated experimentally that animals subjected to a prolonged protein undernutrition exhibit a pronounced loss of the capacity to fabricate antibodies and to resist infection. This loss can be quickly made good by addition to the ration of liberal amount of good protein.

### *Protein in Surgical Treatment*

After surgery various harmful effects of protein deficiency have been noted: 1. Prolonged lag period in the healing of wounds. 2. Danger of wound rupture. 3. Severe shock from surprisingly small losses of blood. 4. Bedsores which represent pressure necrosis in tissues which have been devitalized by protein deficiency.

Proteins are essential to wound healing, to the maintenance of tissue integrity, and from present indications, to expeditious convalesence. Protein deficiency endangers all three.[5]

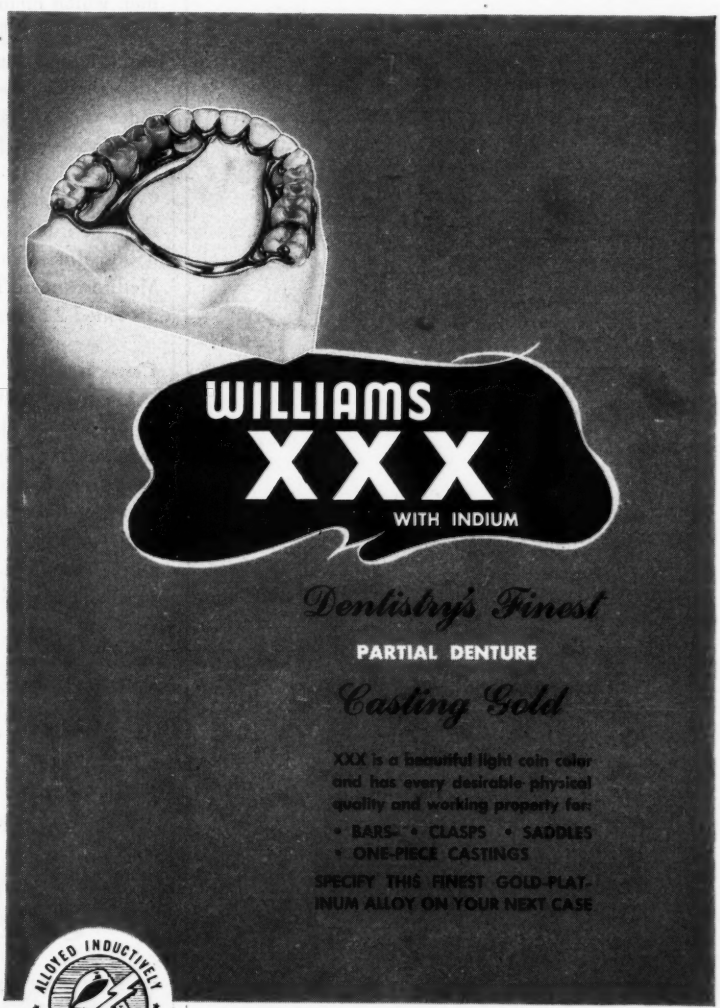
### *Protein in Medical Treatment*

*Nephritis* — Significant improvement in a group of nephritic patients was reported when former ideas of diet were discarded and the allowance of protein was materially increased, in some instances doubled.

*Peptic Ulcer*—(1) Early healing, (2) unusually prompt relief from pain, and (3) rapid gain in strength was noted in 29 patients with ulcers whose nitrogen intake, largely in the form of protein hydrolysates, was about three times that commonly allowed.

(*Continued on page* 180)

[5]Co Tui: The Value of Protein and Its Chemical Components (Amino Acids) in Surgical Repair, Bull. New York Acad. Med. **21**:631, 1945.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*Neurasthenia*—The treatment of neurasthenic syndromes with an abundant diet including liberal amounts of protein is often more effective than psychotherapy.

*Cirrhosis of the Liver*—In a disease that formerly was regarded as invariably fatal, a high protein, low fat regimen which includes also the administration of large quantities of vitamins and crude liver extract, is accomplishing excellent results. A diet that provides 200 to 300 grams of protein daily has been found highly satisfactory.

*Infectious Hepatitis*—In the treatment of infectious hepatitis a diet of 3500 calories successfully used in the Mediterranean Theater of Operation provided 225 grams of protein.

### Conclusion

Measured in terms of (1) greater vigor, (2) quicker and more assured recovery from injury, and (3) a higher degree of morale, it is believed that the generous allotment of protein (140 grams) in the American soldier's ration in the Second World War contributed to the winning of the war.

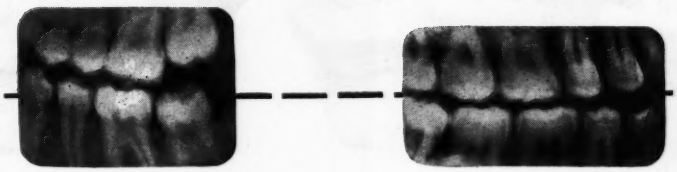
Adapted from *Journal of the American Medical Association* **139**:897-902 (April 2) 1949.

# Contra-Angles

### Out of the Law Books

Court decisions are not among my favorite reading but being inflicted with an inquiry that concerns all printed things, I find myself now and then reading from the legal columns. The Appellate Court of Missouri had under consideration a case that involved an alleged libel by the *St. Louis Post-Dispatch* against a clergyman. The court, in finding for the newspaper, said: "It is only in despotisms that one must speak sub

# Find hidden cavities



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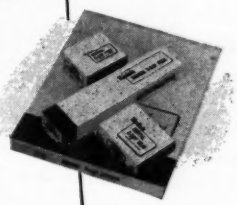

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rosa, or in a whisper with bated breath, around the corner or in the dark, on a subject touching the common welfare. It is the brightest jewel in the crown of the law to seek and maintain the golden mean between defamation on one hand and the healthy and robust air of free discussion on the other."

Every citizen should take heed of these words because freedom of expression is one of the freedoms that is getting out of style in the world. Freedom of speech is not some high-sounding philosophy that appears in the Bill of Rights. It is there, of course, but it is something that enters into the every day living of each one of us. It is what the neighbor says over the fence, it is the conversation on the golf course and at the dinner table. It is the utterance before scientific societies. It is what appears in the newspapers, magazines, and books; it is what we see and hear over television and the radio.

Under a despotism people are not encouraged to assemble except to pay tribute to the despot or expose themselves for slaughter as soldiers. If people do assemble they are fearful to talk because spies and snoopers are everywhere and everything that is said that is unflattering to the regime is reported to the police. The secret police arrest without warrant, imprison without bail, and trials are held without juries. The so-called Peoples Courts are fancy names for plug-uglies in black robes. All these things have happened in recent history in the Germany of Hitler and the Russia of Stalin. It is a virus that is growing in this country.

I have the feeling, although I cannot prove it with imposing figures or statistical analysis, that our own people are growing fearful of expressing themselves. I mean specifically, dentists. The masking words and phrases seem to crop out more and more. For example, "this is off the record," "don't quote me," "strictly confidential." These expressions may mean that dentists are afraid to express themselves for fear of some kind of retaliation. What form of reprisal can be taken against a dentist? A specialist, if he speaks out of turn, may be denied referred patients. A dental school teacher may find himself without a contract renewal. An aspirant for an "honor" in a College may find the flowing gown denied him.

The dentist who doesn't conform to the code set up by some small group may find himself out of favor. To curry favor the safest thing is to be a conformist—never questioning, never speaking out, never taking a stand or making a public declaration. This is playing it safe, putting security ahead of freedom. It is a form of cowardice. Minorities are in power by this kind of intimidation. A dictator, a committee, a small organization sets up a code of conduct and announces that it is correct. The decree is sent forth that whoever does not conform is an outcast. This is the method of all tyrannies inflicted upon the majority by the minority. When we talk of majority rule in government or in dental societies, we are talking nonsense. A well-organized small group of ten men can control the lives of undisciplined and uninformed thousands. Carrying information to the unin-


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formed comes only from freedom of speech and freedom to print and having these freedoms means nothing unless we use them.

Now that we are getting legalistic, let us look at a seventy-five-year-old decision by the Vermont Supreme Court that said:

"Publication must not be made for the purposes of inflicting an injury but to promulgate facts which duty or interest requires to be promulgated. It is not the law that because a man fills a station before the public eye he becomes a target at which all the artillery of ridicule, ill will, or malice may be leveled. He may be assailed when duty or interest demands it and then only under the rules of fair temperate conscientious criticism. Public station may ever be purified, never villified."

This ruling means that when a man assumes public office, he does not become either a saint or a villain. In this country we do not accept the doctrine, "The king can do no wrong," although some of our elective officers occasionally forget that they were elected by the people and not ordained directly by God. Frequently the humility of public men that led to their early popularity becomes soured by the acid of arrogance when they become entrenched in power. Not long after this transformation they end on the political ash pile.

People who have the job of piloting public expression have a task that is important. Being an editor is certainly not the most important calling. In a primitive society it would be among the least important in the scale. In complex society, however, it carries a responsibility. The hardest job is to maintain "fair temperate conscientious criticism." That means to give every man his chance to express his views even if they conflict with the editor's own. It means not denying the right to expression on some flimsy pretense. If we refuse publication or lead an attack on a person or an institution, we should search our deep roots to see if we may not be acting from our prejudices, preconceptions, or self-interest. In that soothing pastime of rationalizing we can excuse so many things in *us*.

### *Hurry, Worry, and Indecision*

Eugene Field wrote *Wynken, Blynken, and Nod*. With his warmth of understanding and expression he could have done equally well composing a story about Hurry, Worry, and Indecision—the disturbing trinity. It was the late Doctor Frank Crane who brought the evils of Rush, Fret, and Fuss to our attention.

Hurry wears us out quicker than does hard work. Living under the tyranny of the timepiece is almost as despotic as living under a dictator. We arise by an alarm clock, rush to get a train or a bus under the accusing fingers of a watch, scurry from one appointment to another all day long. We seldom allow ourselves enough time for anything. The result is that we are in constant turmoil with the timepiece. Rushing makes us breathless, wears out our muscles, and squanders our nervous energy.

The rusher does not impress anyone. The fellow weaving in and out of traffic endangers and annoys. The dentist galloping around his office,

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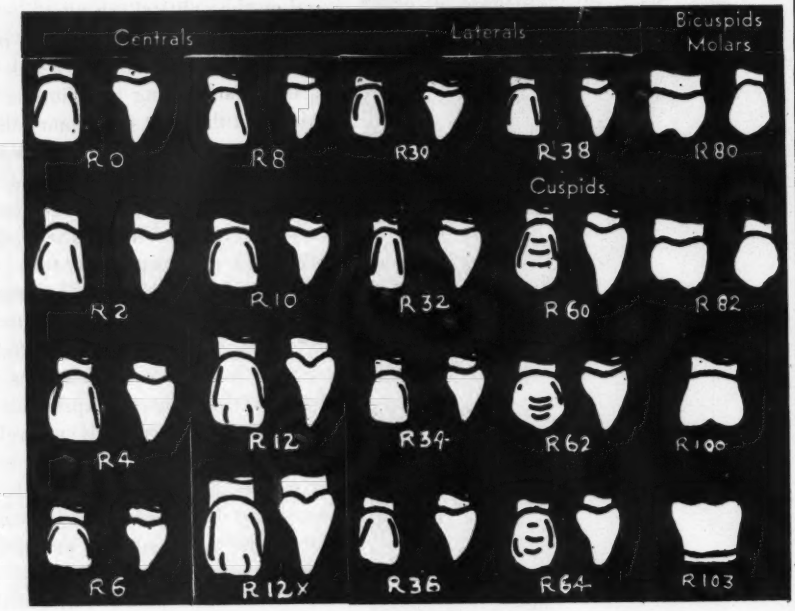


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fussing and fidgeting, does not impress his patients. Doctor Always Late is not admired by people. People are disturbed enough by the dental experience not to wish to be upset by the rushing dentist or the one always late for *his* end of the appointment. Calm begets calm. "The cracked strained voice of tension" aggravates. The dentist free from the tensions of hustle imparts the same feeling of calm to the patient. The patient in the chair wants a composed dentist, not one flitting about like a neurotic housefly.

The fretful are the ones who stew about something that is past or may happen in the future. The present moment is seldom one that induces worry. We haul forth and re-examine the past to flagellate ourselves with our weaknesses, but the past is dead and any amount of worry about it can change it not at all. It is natural to feel remorse for things that we did wrongfully in the past, but worry about these things does not give us future strength—only weakness. This kind of weakness and fear leads to indecision which is the third of the evil forces that Doctor Frank Crane described.

Indecision is a kind of mental ferment in which thoughts bubble around but never get any place. The indecisive can never make up his mind whether he should take a trip or stay at home, buy the new suit or wait for a future bargain. Caution is of value until it leads to indecision. When we can't make up our minds even about trivial things, we are wasting nervous energy that should be channeled to worthwhile ends.

The present day psychobiologist speaks of tension and fatigue states. These are usually brought on by hurry, worry, and indecision. These states account for a large share of the neurotic illnesses of our times. Dentists should become more familiar with them because we are looking at some forms of neuroses every day.—E. J. R.

## Status Lymphaticus, Thymic Death and Anesthesia in Oral Surgery

(*Continued from page* 165)

be much larger than normal for their age.

*Variations in Size*—(1) In the adult the thymus may remain the same or even smaller than its size just before puberty. This condition is described as persisting. (2) The gland

may be twice the normal size because of hyperplasia.

*Symptoms*—The enlarged thymus is usually accompanied by enlargement of (1) adenoids, (2) tonsils and lingual follicles, (3) mesenteric glands and lymphoid structures of the alimentary tract, and (4) the Malpighian bodies in the spleen.

### Symptomatology

The presence of status lymphaticus is often unsuspected. Usually the patient is anemic, flabby, with some history of dyspnea.

*Narrowing of the Vascular System*—A typical patient in whom status lymphaticus is present has been described as slender, graceful, delicately molded with transparent skin and soft hair. The child has almost an angelic appearance. Young adults often reveal modified, retarded, or absent secondary sexual characteristics.

*Characteristic Features*—1. Sudden death. 2. Some children die without uttering a sound and exhibit only a few struggles. 3. In the past the sole postmortem observation was an enlarged thymus and other hypertrophied lymphatic structures. 4. The term thymic death, therefore, sufficiently indicated the cause.

*Detection Difficult*—1. It is almost impossible during life to detect thymic enlargement with certainty.

2. Infrequently, a distinct mass in the suprasternal fossa may seem to be present.

3. Roentgenograms may also prove unreliable because of other shadows present in this area.

*Associated Abnormalities*—Changes occurring with status lymphaticus may be associated with abnormalities illustrating the interrelation of endocrine glands. Many young patients with exophthalmic goiter may have enlarged glands. This is sometimes true of young patients with acromegaly.

### Pathology

In a child who has died from status lymphaticus, the principal morbid conditions seem to be the following:

1. A bulky thymus.

(*Continued on page* 188)

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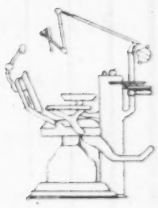

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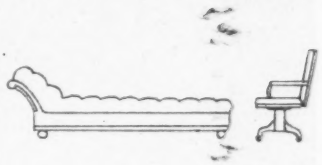


Doctor Philip Parker mixes logic and laughter in presenting his views on psychosomatics in dentistry. He says:

"Yes, sir, psychosomatic dentistry is the latest approach to the cause of our patients' dental ills . . . And the remedy? Simple. The dentist reads a few books on psychiatry and acts as a psychiatrist. He puts a little sign in his window 'Six Couches—No Waiting' and is all set. With psychiatrists and psychologists fighting for possession of the field, what could be more natural than for dentists to jump into the breach?"

He says a lot more that you will want to read for yourself. You'll enjoy every word—whether or not you agree with his serious view that psychosomatics can be over-emphasized in dental treatment.

★ ★ ★

Doctor Herman Brody presents a formula for a topical anesthetic (non-narcotic, non-toxic, non-escharotic, and non-irritating) that can be used prior to the insertion of the hypodermic needle. By minimizing the pain of the needle prick, this anesthetic reduces the apprehension and nervous tension of the patient. The solution may also be used for many other purposes as explained in the article.

★ ★ ★

A dentist by day, and astronomer by night, Doctor Ford E. Bridges is president of the Tulsa Astronomical Society, and a member of the Toronto branch of the Royal Astronomical Society of England. He recommends amateur astronomy to any dentist who is looking for a rewarding and absorbing hobby. Dentists make good astronomers, he says, because they are used to exercising care and giving painstaking attention to detail.

★ ★ ★

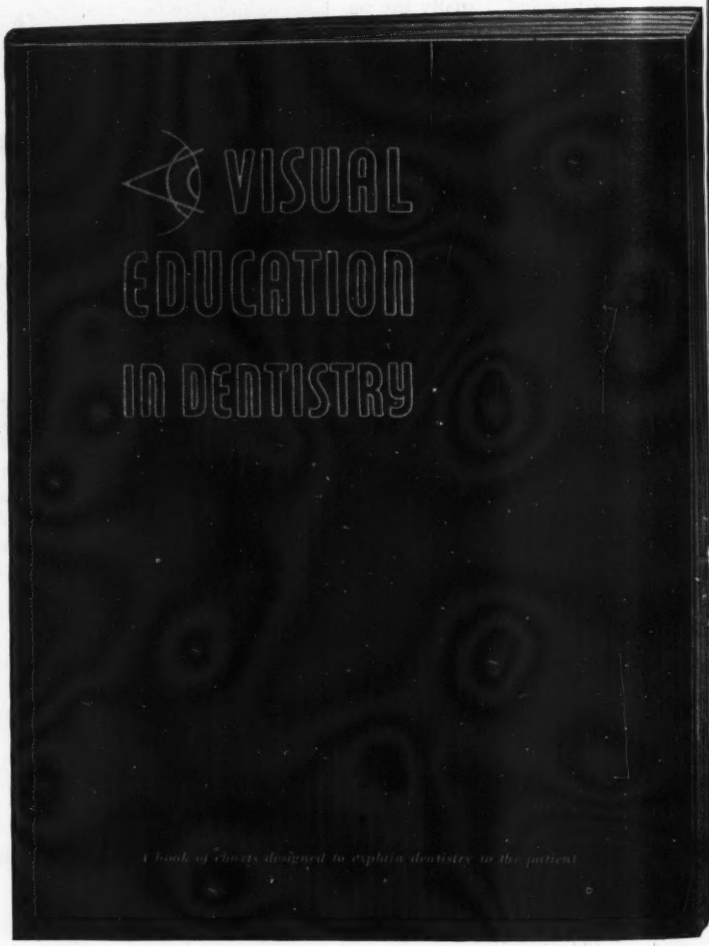
"Should 'Doctors' Talk Politics?" Doctor Clyde Kleinert believes that they should—at least as regards socialized medicine and dentistry. He gives an outline of facts which dentists may find useful in talking to their patients about this current threat to independent dentistry. You will find his summary exceedingly interesting.

★ ★ ★

Here's that neurotic patient again—this time with a gun! A dentist's true story, this article somewhat balances Doctor Parker's protest that psychosomatic dentistry may be over-emphasized. Without some knowledge of psychology, this dentist might have been killed in his office!

★ ★ ★

How's your belt line? . . . Doctor Maurice Teitelbaum found his expanding too fast and cut off twelve pounds in three weeks. He says, "The solution is not in dieting! It is in selective eating." . . . and the list of foods he suggests sound like very good eating indeed.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(*Continued from page* 185)

2. Hypertrophied adenoids and tonsils (if present.)

3. Enlarged Peyer's patches.

4. Enlarged solitary intestinal lymphoid follicles.

*Secondary Conditions*—1. The presence of enlarged lymph glands. 2. Enlarged spleen. 3. Subpleural and subpericardial hemorrhages. 4. Dilatation and muscular degeneration of the heart. 5. Absence of blood in the great veins and cerebral sinuses. Hypoplasia of the cerebral vessels may also exist.

*Microscopic Study*—1. Hyperplasia of the cortical lymphoid follicles is revealed by microscopic study of the thymus gland in status lymphaticus.

2. Sometimes there are large blood sinuses in the thymus containing a greatly increased number of lymphocytes.

3. It was formerly believed that patients with a known lymphocytosis of 40 per cent are poor surgical risks and are liable to sudden death.

4. The lymph nodes may reveal a tendency to formations similar to giant follicular lymphoblastomas, with some destruction of the architecture and an increase in the size and number of germinal follicles.

5. When sudden death has occurred in these cases, some nodes may possibly reveal a change in the shape of the lymph cells.

6. Hyperplasia of the lymphoid tissue is generally associated with increased size and activity of the germinal centers.

### Thymic Death

1. That the normal thymus gland or its extract is a specific cause for acceleration in growth and development has not been established by investigation.

2. That thymus extract represents (1) a secretory product, (2) a physiologic hormone, or (3) a pharmacodynamic agent derived from the thymus is not indicated.

*Conclusion*—1. Some interactivity of the thymus and its related thyroid gland may exist despite the fact that exact function of the former seems obscure.

2. As the thyroid increases in size, the normal thymus undergoes involution until, in the adult, it becomes atrophic. The maximum weight of the thymus at the age of puberty is about 32 grams.

*The Relation of Status Lymphaticus to Sudden Death*—The following are the various theories concerning status lymphaticus and its relation to sudden death:

1. A toxemia of some sort is present.

2. A constitutional anomaly has resulted from some chemical alteration in the tissues to which lymphatic enlargement is secondary.

3. A congenital defect has been acquired in utero, producing a predisposition to sudden death.

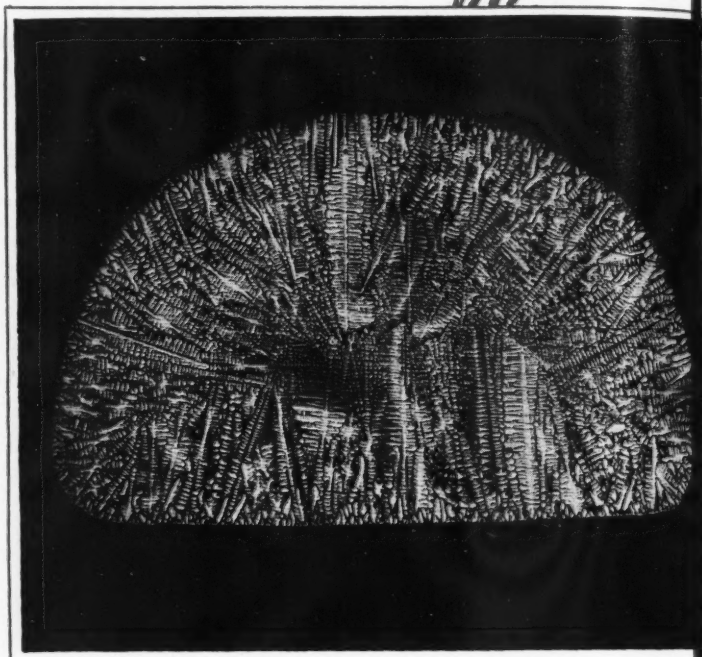
4. A lymphotoxemia is present.

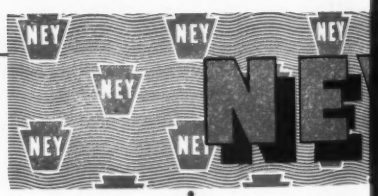
5. The real cause of symptoms has no relation to the thymus but rather there occurs (1) a spasm of the larynx, (2) cardiac failure, or (3) a sudden drop in blood pressure.

6. Cerebral hemorrhage.

7. Suprarenal insufficiency has

Ask a difficult



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produced a hypoglycemia.

8. There is a hypersusceptibility to physical and chemical agents.

9. An anaphylactic reaction has developed due to sensitivity of the body to a specific nucleoprotein formed in the lymph nodes from necrosis of the germinal follicles.

10. A hypoplasia of the blood vessels and heart exists.

### *Anesthesia in Oral Surgery*

Both the anesthesiologist and the surgeon should be aware of the possibility of status lymphaticus, rare though it be: 1. Care should be taken in selection of children or young adults who are to undergo anesthesia and who show possible signs of hypertrophic lymphoid structures, primarily the thymus, spleen, or excessively enlarged adenoids and tonsils.

2. Postponement of operation is advisable, when possible, until the patient has had adequate therapy.

3. Despite the difference in opinion over the status lymphaticus hazard, proper care and foresight as well as good surgical judgment should dictate the advisability of operation.

*Recommended Anesthetic Agents*—The general anesthetic agents safest for administration to patients, particularly children, are those providing a normal percentage of oxygen.

*General Anesthetic*—The anesthetic agent recommended for children is vinethene or ether, or a combination of both.

*Premedication*—Paregoric, 1 to 3 minims, one-half hour before operation may be given, and atropine, 1/500 to 1/300 of a grain hypodermically, the dose depending on the age and weight of the child.

*Local Anesthetics*—For children, a local anesthetic should not include adrenalin. An elixir of a rapid acting barbiturate is advised for a child one-half hour before administration of a local anesthetic.

### *Summary*


1. Each child should be considered a potential case of status lymphaticus.

2. In the exercise of proper care and judgment in administration of anesthetic much psychic, phsyiologic, and consequent anesthetic damage may be eliminated. Careful selection may prevent unnecessary loss of a life.

3. Reported evidence supports rather than disproves the existence of status lymphaticus, though trend of opinion is toward its nonexistence as a pathologic entity.

4. In operations upon children, until it has been proved not to exist, this condition should be kept in mind as a possible though rare complication.



From *Anesthesia and Analgesia* **28**:225-229 (July-August) 1949.



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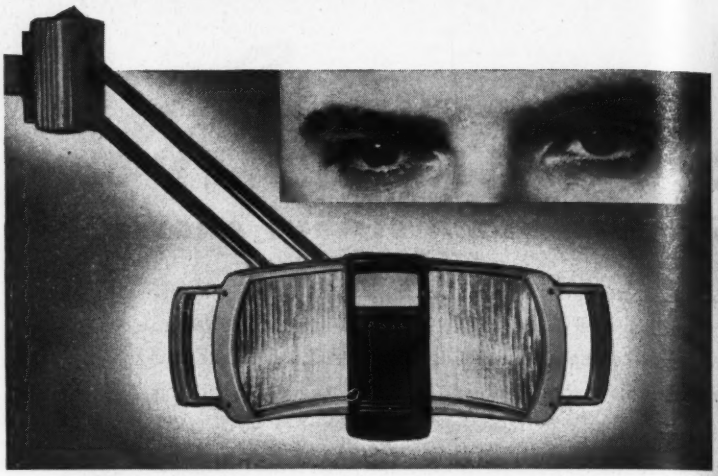

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